CITY OF BLOOMINGTON

BOARD OF ZONING APPEALS

May 23, 2024 @ 5:30 p.m.
City Hall, 401 N. Morton Street
Common Council Chambers, Room #115

https://bloomington.zoom.us/j/82448983657?pwd=enJxcnArK1pLVDlnWGROTU43dEpXdz09

Meeting ID: 824 4898 3657
Passcode: 319455

CITY OF BLOOMINGTON
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City Hall, 401 N. Morton Street
Common Council Chambers, Room #115 and via Zoom

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❖Virtual Meeting:
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Meeting ID: 824 4898 3657 **Passcode: 319455**

Petition Map: https://arcg.is/1aHCbe

ROLL CALL

APPROVAL OF MINUTES: April 18, 2024

PETITIONS CONTINUED TO: June 20, 2024

AA-17-22 **Joe Kemp Construction, LLC & Blackwell Construction, Inc.**
Summit Woods (Sudbury Farm Parcel O) W. Ezekiel Dr.
Parcel(s): 53-08-07-400-008.002-009, 53-08-07-400-008.004-009…
Request: Administrative Appeal of the Notice of Violation (NOV) issued March 25, 2022. *Case Manager: Jackie Scanlan*

V-27-22 **Cutters Kirkwood 123, LLC**
113 E. Kirkwood Ave.
Parcel: 53-05-33-310-062.000-005
Request: Variances from Downtown Character Overlay standards to allow less non-residential area and less large display windows; and a variance from the requirement to align with the front setback of an adjacent historic structure in the Mixed-Use Downtown zoning district with the Courthouse Square Character Overlay (MD-CS). *Case Manager: Jackie Scanlan*

V-05-24 **Candi Sipes**
2303 S Rockport Road
Parcel: 53-01-51-137-500.000-009
Request: Variances from accessory structure size standards, accessory structure setbacks, driveway width standards, and a determinate sidewalk variance to allow construction of a new single-family dwelling structure in the Residential Medium Lot (R2) zoning district. *Case Manager: Gabriel Holbrow*

****Next Meeting: June 20, 2024**

The City is committed to providing equal access to information. However, despite our efforts, at times, portions of our board and commission packets are not accessible for some individuals. If you encounter difficulties accessing material in this packet, please contact Melissa Hirtzel at hirtzelm@bloomington.in.gov **and provide your name, contact information, and a link to or description of the document or web page you are having problems with.**

V-08-24 **Andrew Huck**
2226 East Maxwell Lane
Parcel: 53-08-03-100-002.000-009
Request: Variance from riparian buffer standards to allow construction of deck stairs and terrace for an existing single-family dwelling in the Residential Medium Lot (R2) zoning district. *Case Manager: Gabriel Holbrow*

PETITIONS:

V-10-24 **Ruby Creek Homes**
914 N. Oolitic Drive
Parcel(s): 53-05-32-201-076.057-005
Request: Variance from the Karst Geology standards to allow the construction of single-family homes in the Residential Medium Lot (R2) zoning district.
Case Manager: Katie Gandhi

V-13-24 **Ruby Creek Homes**
918 N. Oolitic Drive
Parcel(s): 53-05-32-201-106.058-005
Request: Variance from the Karst Geology standards to allow the construction of single-family homes in the Residential Medium Lot (R2) zoning district.
Case Manager: Katie Gandhi

V-14-24 **Ruby Creek Homes**
922 N. Oolitic Drive
Parcel(s): 53-05-32-201-077.059-005
Request: Variance from the Karst Geology standards to allow the construction of single-family homes in the Residential Medium Lot (R2) zoning district.
Case Manager: Katie Gandhi

V-15-24 **Sarah Nelson**
803 E. Winslow Road
Parcel: 53-08-09-400-002.000-009
Request: Variance from fence height standards in the Residential Small Lot (R3) zoning district. *Case Manager: Katie Gandhi*

V-16-24 **BPO Elks #446**
400 N. Walnut St
Parcel: 53-05-33-306-003.000-005
Request: Variance from front yard setback requirements for a flag pole in the Mixed-Use Downtown (MD) within the Downtown Core Overlay (DCO) zoning district. *Case Manager: Eric Greulich*

CU-17-24 **Bloomington Builders, LLC & Latitude 39 North Properties, LLC**
506 E. Wylie Street
Parcel: 53-08-04-113-095.000-009
Request: Conditional Use approval to allow a duplex in the Residential Lot (R3) zoning district. *Case Manager: Eric Greulich*

****Next Meeting: June 20, 2024**

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Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or E-mail human.rights@bloomingto.in.gov.

****Next Meeting: June 20, 2024**

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BLOOMINGTON BOARD OF ZONING APPEALS **CASE #: V-10-24/ VAR-2024-03-0028**
STAFF REPORT **DATE: May 23, 2024**

Location: 914 N Oolitic Dr (parcel #53-05-32-201-076.057-005) (Lot 57 of Forest Homes)

PETITIONER: Ruby Creek Homes
11990 E 1400 N, Oden, IN 47562

CONSULTANTS: Melvin Graber
11990 E 1400 N, Oden, IN 47562

REQUEST: Variance from Karst Preservation standards to allow disturbance within 25' of the last closed contour of a karst feature for a property in the Residential Medium Lot (R2) zoning district.

REPORT: This 0.2-acre property is located at 914 N Oolitic Dr. The property is zoned Residential Medium Lot (R2). Surrounding zones are all Residential Medium Lot (R2) and surrounding land uses are all Dwelling, Single Family (detached).

Previous to the current owner, this lot of record, along with the Forest Homes Lots 58 and 59 (918 and 922 N Oolitic), were owned by the same owner and two mobile homes sat on all three lots for many years.

There is a karst feature, a sinkhole, located on this property. Existing elevations on this site range from 874 feet to 878 feet. There is currently no stormwater infrastructure at or near this site.

Chapter 4 of the Unified Development Ordinance (UDO), Title 20 of the Bloomington Municipal Code) states that no land-disturbing activity, mowing, or temporary or permanent structure shall be allowed within the sinkhole nor within 25 feet of the last closed contour of the sinkhole. Title 20 of the UDO defines the sinkhole as the last closed contour line of the feature on the City's geographic information system. Historic contour mapping shows that this entire property located at 914 N Oolitic falls within the last closed contours of the karst feature, which is at an elevation of 882 feet, which means that according to the UDO, the entire lot cannot be disturbed. Since this entire site lies within the area shown to be within the last closed contour of the karst feature, a variance must be granted to allow any disturbance on this property.

The petitioner is requesting a variance from the karst preservation standards to allow disturbance within 25' of the last closed contour of the karst feature.

As part of this variance request, a report of geotechnical engineering exploration was submitted. The report confirmed that a sinkhole is present on the site and it provided information about soil composition in two locations on this property through analysis of soil borings. The report also provided sinkhole remediation methods of treatment and construction recommendations for placing a single family structure on the site.

CRITERIA AND FINDINGS FOR DEVELOPMENT STANDARDS VARIANCE
20.06.080(b)(3)(E) Standards for Granting Variances from Development Standards:

A variance from the development standards of the Unified Development Ordinance may be approved only upon determination in writing that each of the following criteria is met:

1) *The approval will not be injurious to the public health, safety, morals, and general welfare of the community.*

   PROPOSED FINDING: The granting of the variance will not be injurious to the public health, safety, morals, or general welfare of the community. A number of structures have existed in and around this karst feature for many years with no collapse. Proper testing of and restoration of the site will be required before building construction is allowed in order to maximize water infiltration on the site and ensure that water is not diverted off site, and to make sure that the site is safe for construction.

2) *The use and value of the area adjacent to the property included in the Development Standards Variance will not be affected in a substantially adverse manner.*

   PROPOSED FINDING: No adverse impacts to the use and value of surrounding properties as a result of the requested variance are found. The majority of this property is located four feet in elevation higher than the apparent lowest point of the property. Current site elevation conditions show that the portions of the karst feature that are most sensitive are found on the adjacent property to the north of this property. With the remediation of the sinkhole, drainage analysis and the installation of drainage solutions, impact to surrounding properties should be mitigated.

3) *The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the Development Standards Variance will relieve the practical difficulties.*

   PROPOSED FINDING: The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property because it renders the entire site unbuildable. There has been development within the last closed contour of this feature for a number of years without any indications of negative impact. The practical difficulties are peculiar to the property in question because it is uncommon for an entire property to be located within a UDO-defined sinkhole, but because the properties in this area are smaller, the extent of the last closed contour of the sinkhole renders the entire site unbuildable.

RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopt the proposed findings and approve **V-10-24/ VAR-2024-03-0028, with the following conditions:**

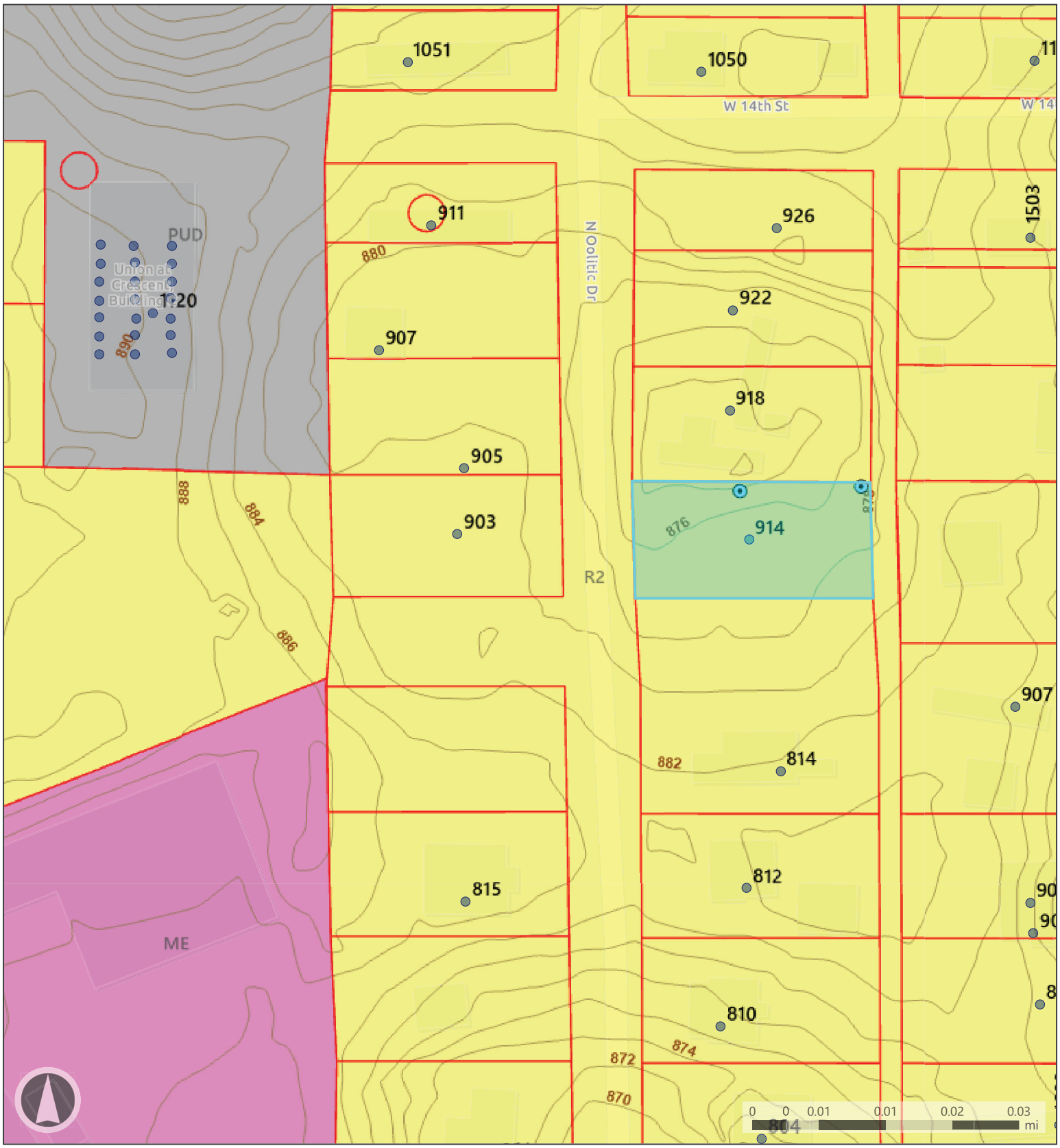
1. Development of the lot is limited to the east half of the lot, beyond the 876 contour line, in order to maximize the area of land present between development and movement of water toward the sinkhole on the adjacent lot to the north.
2. Implementation of sinkhole remediation as outlined in the attached geotechnical report, is required – at all three properties (914, 918 and 922 N Oolitic) - before any Certificate of Zoning Compliances will be issued.
3. Submission of a drainage and water flow analysis post-sinkhole remediation is required before a Certificate of Zoning Compliance will be issued. The report must be approved by City of Bloomington Planning & Transportation and Utility Departments.
4. Implementation of design and construction recommendations provided in the attached geotechnical report is required before a Certificate of Zoning Compliance will be issued.
5. Soil and water contamination testing and provision of any necessary remediation identified related to those tests is required before a Certificate of Zoning Compliance will be issued.
6. A Zoning Commitment shall be recorded indicating the presence of the karst feature and describing the Karst Conservancy Easement before a Certificate of Zoning Compliance will be issued.

7.

City of Bloomington

Location Map

V-10-24/ VAR-2024-03-0028



Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary
- Mixed-Use Employment
- Planned Unit Development
- Residential Medium Lot

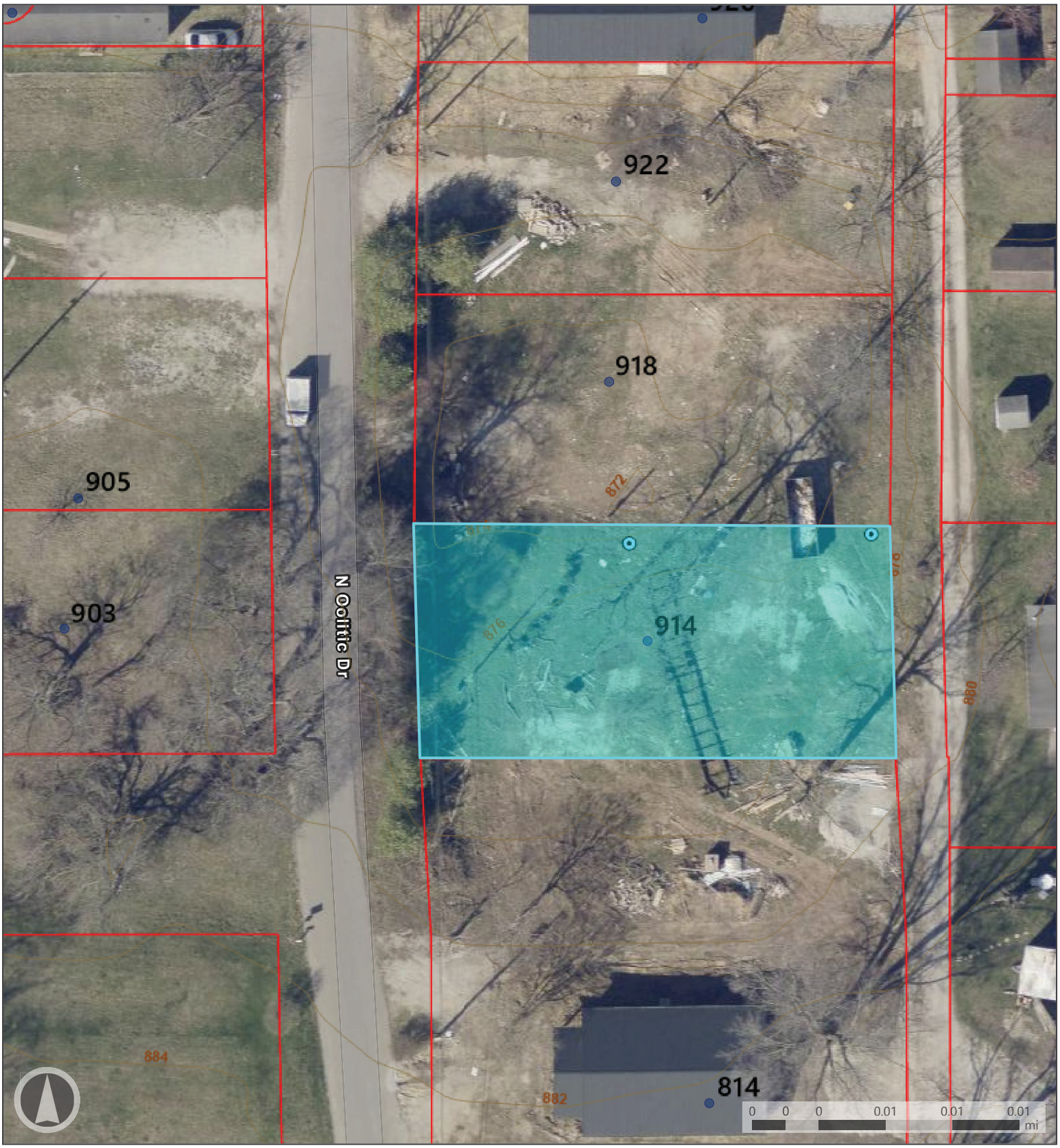
Created: 5/17/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.

City of Bloomington

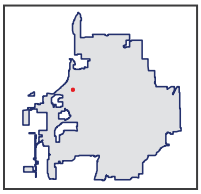
Context Aerial

V-10-24/ VAR-2024-03-0028



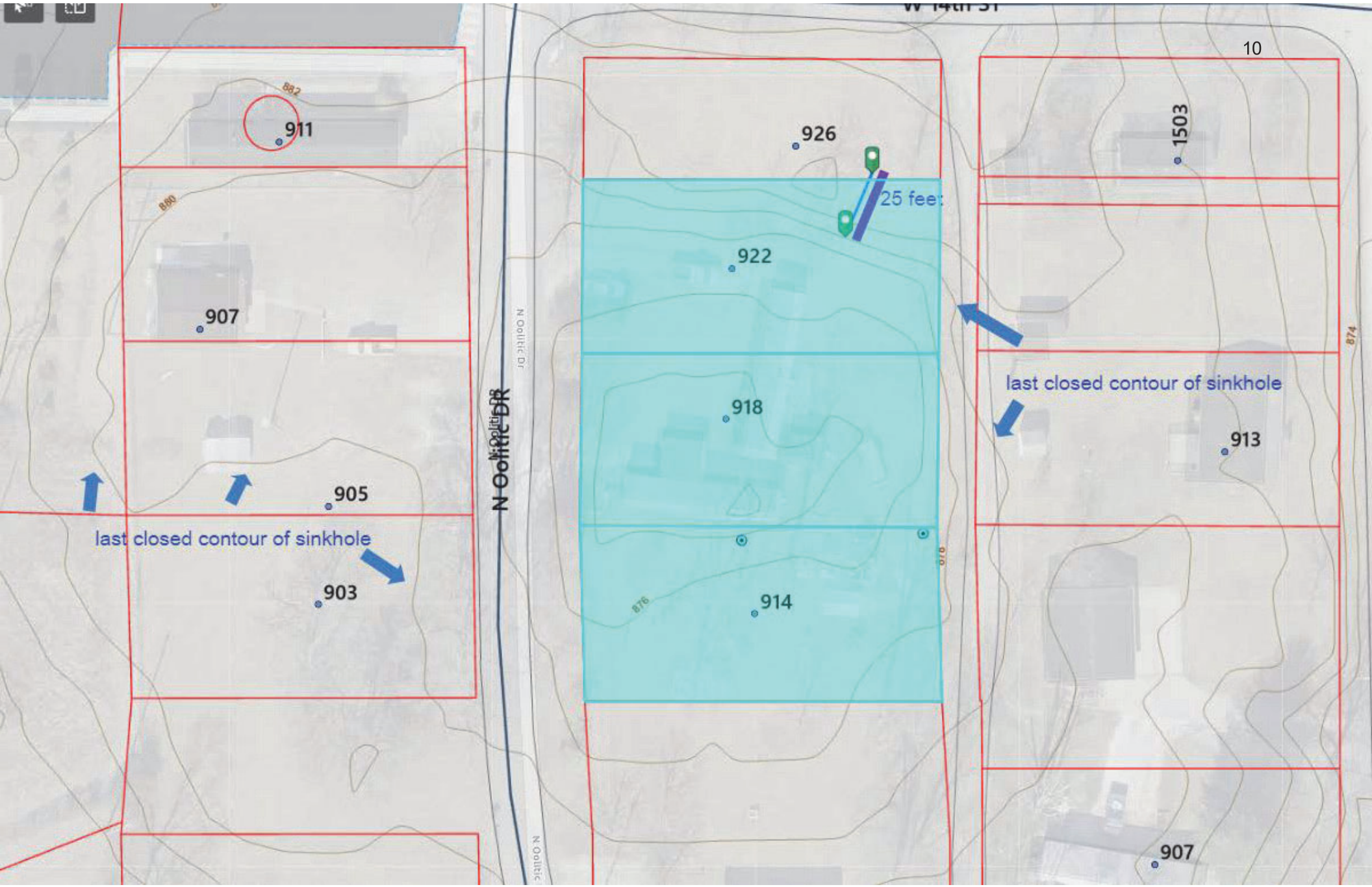
Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary

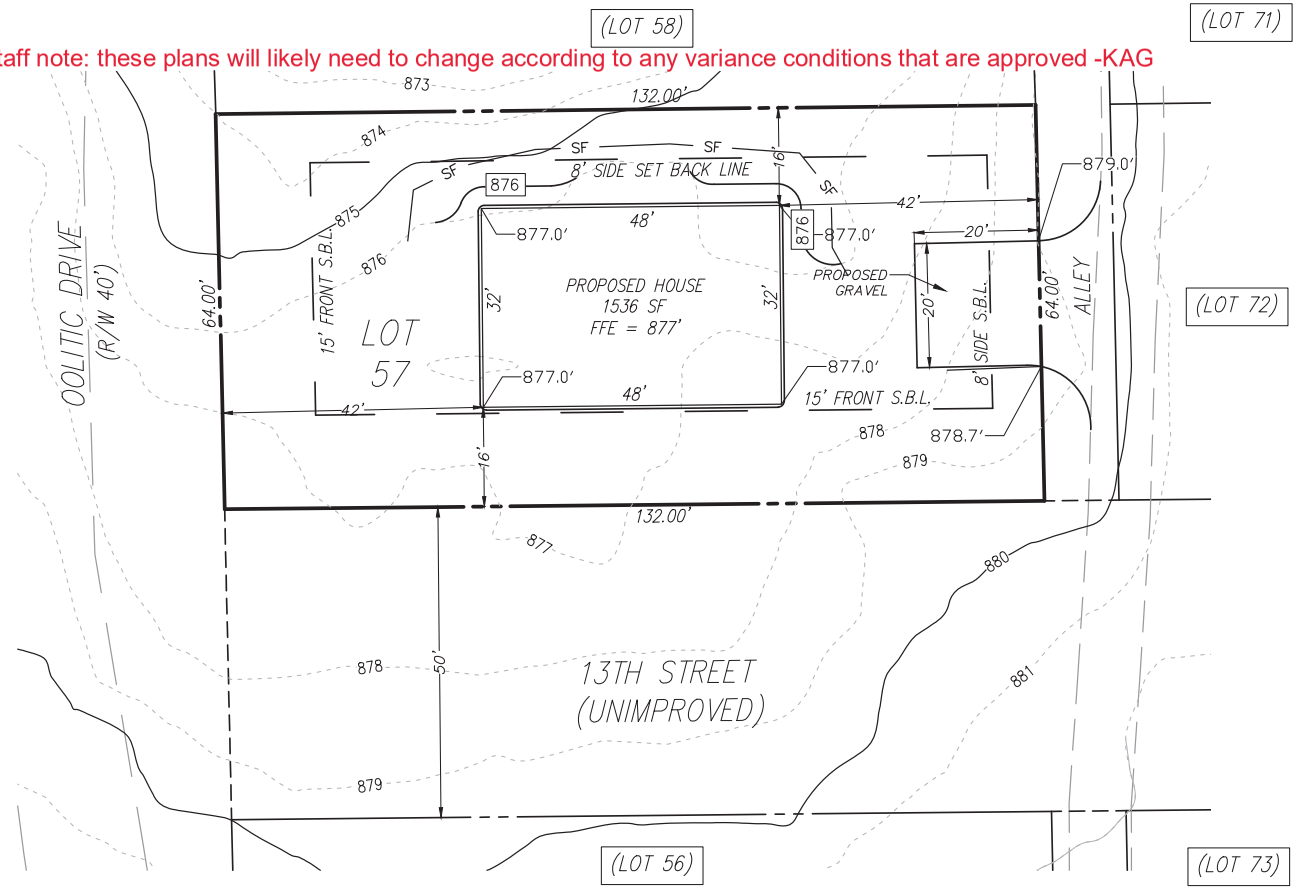


Created: 5/17/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.


10
911
907
905
903
926
922
918
914
25 fee
1503
913
907
last closed contour of sinkhole
last closed contour of sinkhole
N Oolitic DR
882
880
876
874

staff note: these plans will likely need to change according to any variance conditions that are approved -KAG



NORTH

20 0 20

SCALE 1" = 20 ft

PROPERTY LINE
PAVEMENT EDGE
SET BACK LINE
SILT FENCE — SF — SF
FINISH CONTOUR ELEV. — 806
EXISTING CONTOUR ELEV. — 808

TOWNSHIP: Bloomington, Section 32
DESCRIPTION: Lot 57, Forest Homes

USE: Single Family Residential
PARKING PLAN: 2 parking spaces/unit required

OWNER ADDRESS:
11990 E. 1400 N.
ODON, IN 47562

NOTE:
BUILDER TO GRADE LOT TO PROVIDE ADEQUATE DRAINAGE AWAY FROM BUILDING

NOTE:
See Architectural Plans for house dimensions.

NOTES:
This plot plan complies with Chapter 802-4

This plot plan complies with the requirements under Chapter 815, including positive drainage away from the structure are shown as compliant.

Prepared by:

Charles D. Graham
Registration No. LS29500014

CHARLES D. GRAHAM
REGISTERED
No.
LS29500014
STATE OF
INDIANA
LAND SURVEYOR

I affirm under penalties of perjury, that I have taken reasonable care to redact each social security number in this document, unless required by law.

PLOT PLAT FOR PARCEL #53-05-32-201-076.057-005
914 North Oolitic Drive, Bloomington, IN 47408
Lot 57, Forest Homes Addition
RUBY CREEK HOMES, LLC.

Date:10/23/2023

Project No: 5023089

BYNUM FANYO & ASSOCIATES, INC.
528 North Walnut Street
Bloomington, Indiana 47404
Phone (812)332-8030 Fax (812)339-2990

To Whom it may concern,

Ruby Creek Homes LLC (RCH) is requesting a variance from code UDO 20.04.030(g) Pursuant to Indiana Code 36-7-4-918.5.

Project Location

914, 918, 922 N Oolitic Dr.
(See Attached Survey)

Scope of Project

In 2023, 2 delapitated homes were removed from said properties (Demo Permit #s R-23-610, R-23-612) for the:

Purpose of New Home Construction

See Attached Site Plan

Difficulties

The strict application of UDO 20.04.030(g) renders the entire properties undevelopable, for which use it was previously intended. See Attached - Forrest Homes Development Recording 1927
Granting the requested Variance would:
Improve neighboring Property values
And would be an asset rather than a liability to public health safty and general welfare of the community by providing much needed and deficiant "Affordable Housing".

staff note: these plans will likely need to change according to any variance conditions that are approved -KAG

Camera 1

New Plans For::::

Cedar 4 Bedrooms

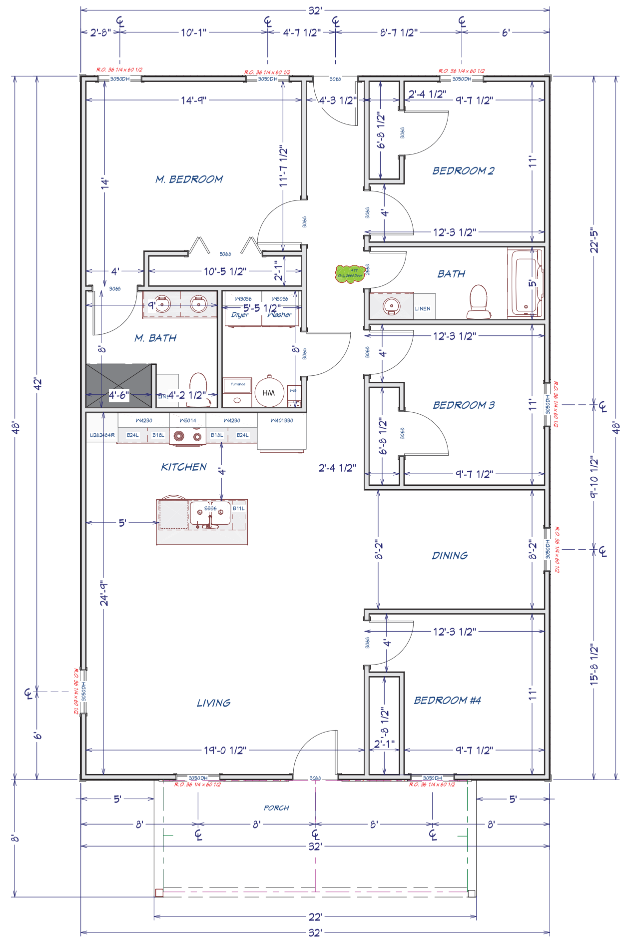
Project Overview

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

DATE: 10/2/2023

SCALE:

SHEET: P-1



LIVING AREA
1529 SQ FT

1st Floor

FRAMING NOTES ::::::::::::

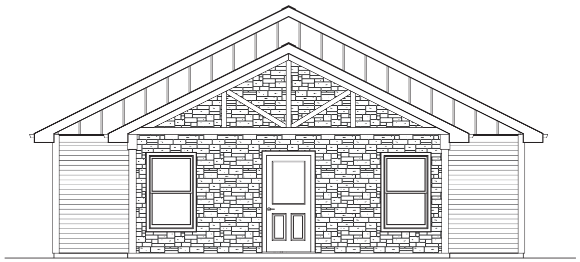
ALL EXTERIOR WALLS ARE SHOWN AS 4" WALLS UNLESS NOTED OTHERWISE
ALL INTERIOR WALLS ARE SHOWN AS 3 1/2" WALLS UNLESS NOTED OTHERWISE
97 1/8' WALLS UNLESS NOTED OTHERWISE
ALL EXTERIOR MEASUREMENTS TO O.S.B.
ALL INTERIOR MEASUREMENTS TO FACE OF STUD
WINDOW R.O. INCLUDED FOR SILVERLINE WINDOWS
ALL HEADER HEIGHTS AT 83" UNLESS NOTED OTHERWISE

New Plans For:::::
Cedar 4 Bedrooms

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

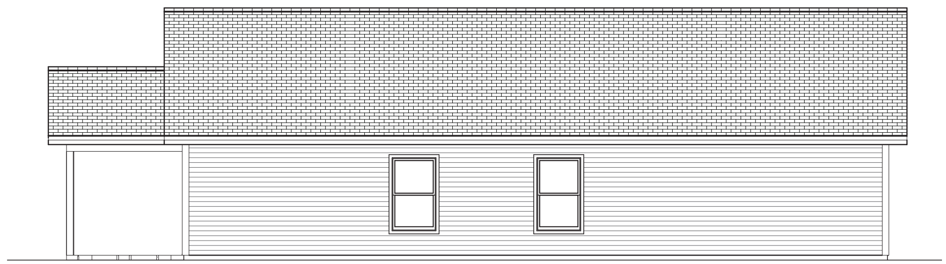
DATE:
10/2/2023
SCALE:

SHEET:

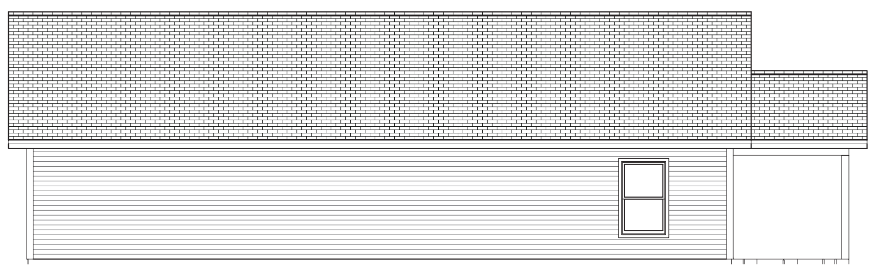


Elevation 1

Elevation 2



Elevation 3



Elevation 4

New Plans For:::::

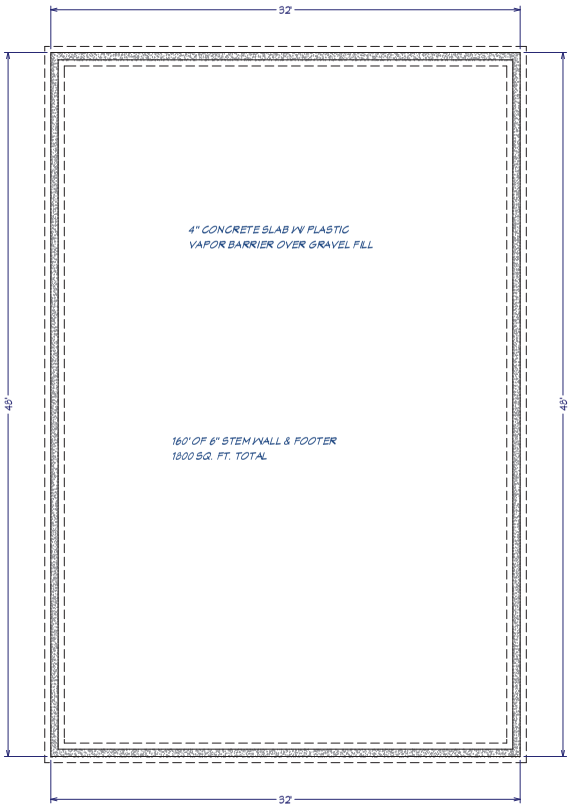
Cedar 4 Bedrooms

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

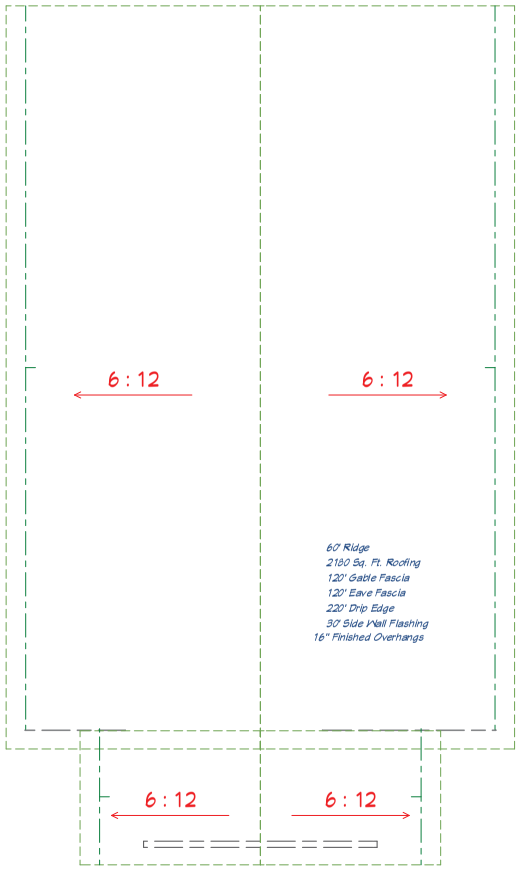
DATE:
10/2/2023

SCALE:

SHEET:



Foundation



Attic

New Plans For::::

Cedar 4 Bedrooms

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Bloomington, IN 47404
812-988-6538
kwagler88@sbcglobal.net

DATE:
10/2/2023

SCALE:

SHEET:


955-ROLL

REPORT OF
GEOTECHNICAL ENGINEERING EXPLORATION

OOLITIC DRIVE RESIDENCES
BLOOMINGTON, INDIANA

PREPARED FOR:

RCH, LLC
1190 EAST 1400 NORTH
ODON, INDIANA 47562

Patriot Engineering and Environmental, Inc.
2006 South Yost Avenue
Bloomington, Indiana 47403

May 6, 2024

May 6, 2024

Mr. Melvin Graber
RCH, LLC
11990 East 1400 North
Odon, Indiana 47562

Re: **Report of Geotechnical Engineering Exploration**
Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

Dear Melvin:

Attached is the report of our geotechnical engineering exploration for the above referenced project. This exploration was completed in general accordance with our Proposal No. P24-0688-11G dated March 25, 2024.

This report includes detailed and graphic logs of six (6) soil borings drilled at the proposed project site. Also included in the report are the results of laboratory tests performed on samples obtained from the site, and geotechnical recommendations pertinent to the site development, foundation design, and construction.

We appreciate the opportunity to perform this geotechnical engineering exploration and are looking forward to working with you during the construction phase of the project. If you have any questions regarding this report or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Mark Jonard, E.I.
Geotechnical Engineer

WILLIAM D. DUBOIS REGISTERED 60018167 STATE OF INDIANA PROFESSIONAL ENGINEER

William D. Dubois, P.E.
Senior Principal Engineer

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APPENDICES

Appendix A: Site Vicinity Map (Figure No. 1)
Boring Location Map (Figure No. 2)
Boring Logs
Boring Log Key
Unified Soil Classification System (USCS)

Appendix B: Seismic Site Class Evaluation

Appendix C: General Qualifications
Standard Clause for Unanticipated Subsurface Conditions

REPORT OF GEOTECHNICAL ENGINEERING EXPLORATION

Oolitic Drive Residences
922 Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

1.0 INTRODUCTION

1.1 General

RCH, LLC is planning the construction of a three (3) small single-family homes to be located at the three (3) lots at 922 North Oolitic Drive in Bloomington, Indiana. The results of our geotechnical engineering exploration for the project are presented in this report.

1.2 Purpose and Scope

The purpose of this exploration is to determine the general near surface and subsurface conditions within the project area and to develop the geotechnical engineering recommendations necessary for the design and construction of the proposed structures. This was achieved by drilling soil borings, and by conducting laboratory tests on samples taken from the borings. This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and recommendations to aid in the design and construction of the proposed facility.

2.0 PROJECT INFORMATION

The proposed project is located along Oolitic Drive in Bloomington, Indiana. The project consists of three (3) single-family homes being built. These homes will be one (1)-story structures of slab-on-grade construction, approximately 32 feet by 48 feet of in plan dimension.

No structural loading information is available to us at the time of this report, but based on similar projects in the area, we can estimate that the proposed structures will have wall loads not exceeding 1,500 pounds per lineal feet (plf), isolated column loads not exceeding 60 kips, and that floor loads will not exceed 150 pounds per square foot (psf). Additionally, based on visual observations of the existing site, it is assumed that any grade raise fill to complete the construction of building pads, finished pavement subgrades, etc., will not exceed 2 feet above the existing ground surface.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The project site is presently an approximately 0.6 acres used for residential purposes. There were previously two (2) modular homes that were removed prior to our mobilization. The surrounding area is generally an area of residential development. The topography in the area proposed for construction is slopped down towards the center of the site, where a recorded sinkhole, per the Indiana Sinkhole Inventory provided by the Indiana Geological Survey, is present. Although the proposed buildings are not planned to be placed above the sinkhole, remediation is require for the project.

3.2 General Subsurface Conditions

Our interpretation of the subsurface conditions is based upon six (6) soil borings drilled at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". All depths discussed below refer to depths below the existing ground surface. Based on the results of the soil borings completed at the site, the following subsurface profile is presented. A description of each general soil unit has been identified and is described below:

Topsoil – Topsoil, a surficial layer of material that is a blend of silts, sands, and clays, with varying amounts of organic matter, was encountered at the ground surface at all of the six (6) boring locations. The topsoil layer was about 3 to 8 inches thick in the borings.

Silty Clay (CL) - The surficial layer is generally underlain by brown, slightly moist to very moist, soft to very stiff, silty clay. The silty clay layers extended to depths of 6 to 13.5 feet below the existing ground surface. The natural moisture content of this material ranges from 16 to 29 percent (%). The silty clay layers have unconfined compressive strengths, as determined by a hand penetrometer, of 1.9 to 4.5 tons per square foot (tsf). Standard Penetration Test N-values in this material varied from 4 to 23 blows per foot (bpf). Additionally, fill material, such as asphalt, gravel, brick and organics, was observed in multiples borings to varying depths (see the Table 1 below).

Clay (CH) - The silty clay layer is underlain by red, moist to very moist, medium stiff to hard, *High plasticity* clay. The clay layers extended to depths of 10 to 20 feet below the existing ground surface. The natural moisture content of this material ranges from 26 to 40 %. The silty clay layers have unconfined compressive strengths of 3.0 to 3.9 tsf. Standard Penetration Test N-values in this material varied from 13 to greater than 50 bpf.

Limestone – Below the clay layers at auger refusal, highly weather limestone was present.

The soil conditions described above are general, and some variations in the descriptions should be expected; for more specific information, please refer to the boring logs presented in Appendix "A". It should be noted that the dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. In-situ stratification changes could occur gradually or at different depths.

As previously mentioned, soft clays and unsuitable fill material were encountered in four (4) of the six (6) borings, at depths up to 13.5 feet below the existing ground surface. The following table presents the extent of the unsuitable soils encountered in the borings:

Table No. 1: Summary of Unsuitable Soils Encountered in Borings

Boring Number	Soil Classification	Approximate Depth of Unsuitable Soils (feet)[1]
B-3	Silty Clay (CL) with some asphalt and gravel (FILL)	3.5 to 6
B-4	Silty Clay (CL) with some asphalt (FILL)	0 to 3.5
	Asphalt and Gravel (FILL)	3.5 to 6
B-5	Soft Silty Clay (CL) with a trace of gravel and organics (FILL)	0 to 6
B-6	Silty Clay (CL) with a trace of asphalt (FILL)	0 to 6
	Silty Clay (CL) with some gravel and brick (FILL)	6 to 13.5

[1] Represents depth below existing ground surface.

3.3 Groundwater Conditions

The term groundwater pertains to any water that percolates through the soil found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water-bearing year round.

Groundwater was observed during drilling in one (1) of the soil borings (B-5) performed at the site at depths of 13 feet below the existing ground surface. Groundwater was not observed in the remaining borings during drilling. Immediately after the borings were completed and the augers were removed from the boreholes, groundwater was not observed.

It should be recognized that fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. ***The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this exploration.***

4.0 DESIGN RECOMMENDATIONS

4.1 Basis

Our recommendations are based on data presented in this report, which include soil borings, laboratory testing, and our experience with similar projects. Subsurface variations that may not be indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected.

4.2 Overall Site Evaluation

The borings indicate that the site is mostly underlain by clayey (CL) soils with fill materials observed in multiple borings. In general, the areas near soil borings performed may be suitable for the anticipated development following removal of the fill material. The soils will then be suitable for shallow foundations, and for support of floor slabs and pavements with these undercuts and soil replacement with compacted structural fill of the near surface soils. Additional Concerns for construction are listed below.

Expansive (Highly Plastic) Clays

Four (4) of the six (6) borings encountered highly plastic (expansive) clays (CH) at depths typically between about 6 and 20 feet below the existing ground surface. Expansive soils undergo volume changes upon wetting and drying. Expansive soils tend to shrink on drying and expand when the degree of saturation increases. However, the primary factors

that govern the amount of expansion of the soils are the availability of moisture and the amount and type of clay particles in the soil.

In Indiana, typically expansive soils within the upper 5 to 10 feet of the surface grade are influenced most by climatic environmental factors, which affect the water content of the soils and hence cause the soils to shrink and swell. This range of influence is generally referred to as the active zone. Foundations, floor slabs, pavements and subsurface utilities placed on or in this active zone of highly plastic (expansive) clays can be subjected to detrimental effects of shrink and swell; which can cause unsuitable total and/or differential settlements, along with cracking. Therefore, we recommend that foundations, floor slabs, pavements, other infrastructure not bear or be placed directly on highly plastic clays (CH). Positive drainage of surface water both during construction and after construction is complete will be especially important to reduce the amount of surface water that is allowed to permeate into the subgrade soils and subsequently reduce the potential for unsuitable shrinking or swelling of the underlying highly plastic clays. Water and drainage lines should be located such that if any leakage occurs, water will not be readily accessible to foundations, floor slabs and/or pavement sections. Additionally, the installation and use of an irrigation system at the parcel is highly discouraged.

Karst

The project site is located within a region known for karstic features. Karstic areas are typically associated with the development of solution features within the soluble carbonate bedrock leading to formation of sinkholes. A sinkhole is described as “Closed depression in soil or bedrock formed by the erosion and transport of earth material from below the land surface.” Sinkholes may develop within karstic areas as a result of soil fines migrating from the overburden soil by infiltrating water flowing downward into the bedrock through solution features/channels, such as voids and clay seams within the rock. Sinkholes may consist of a relatively localized weathered feature or larger features resulting from a collapse within a void formed in the overburden soils as a result of loss of the fine soils into the bedrock features. A sinkhole was observed on-site, as well as confirmed by the Indiana Sinkhole Inventory provided by the Indiana Geological Survey. Recommendations for remediation can be found in Section 5.2. If further evaluation of karst is desired, *Patriot* can provide geophysical testing services.

4.3 Foundations

As previously mentioned, unsuitable fill material was encountered in four (4) of the six (6) to depths up to 13.5 feet below existing grade and it is highly likely that potential existing fill

materials could be present within the project area due to previous construction activities. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the footing level or below, they must be undercut 3 feet below the bottom of the foundation and replaced with well-compacted structural fill prior to construction of foundations or the footings can be extended to suitable natural soils.*** Following the excavation of the footing areas, the foundations subgrade should be visually inspected by a *Patriot* representative and probed at multiple locations at isolated footings and at every 10 feet (maximum) along wall footings using a Dynamic Cone Penetrometer (DCP) to a minimum depth of 5 feet below the footing subgrade to verify that the underlying soil has a SPT blow count of 7 or more or unconfined compressive strength of 1.0 tsf or more. Any unsuitable soils encountered at the footing subgrade or below should be removed and replaced with well-compacted structural fill.

Provided the above recommendations are followed, the proposed structure can be supported on spread footings bearing on the medium stiff to very stiff silty clay encountered at shallow depths or on new well-compacted structural fill overlying the same. These footings should be proportioned using a net allowable soil bearing pressure not exceeding 2,000 pounds per square foot (psf) for column footings or 1,500 psf for wall (strip) footings. For proper performance at the recommended design bearing pressure, foundations must be constructed in compliance with the recommendations for footing excavation inspection that are discussed in Section 5.0 *"Construction Considerations"*.

In using the above net allowable soil bearing pressures, the weight of the foundation and backfill over the foundation need not be considered. Hence, only loads applied at or above the minimum finished grade adjacent to the footing need to be used for dimensioning the foundations. Each new foundation should be positioned so it does not induce significant pressure on adjacent foundations; otherwise the stress overlap must be considered in the design.

All exterior foundations and foundations in unheated areas should be located at a depth of at least 24 inches below final exterior grade for frost protection. We recommend that wall (strip) footings be at least 18 inches wide and column footings be at least 24 inches wide for bearing capacity considerations.

We estimate that the total foundation settlement should not exceed approximately 1 inch and that differential settlement should not exceed about ¾ inch. Careful field control during construction is necessary to minimize the actual settlement that will occur.

Positive drainage of surface water, including downspout discharge, should be maintained away from structure foundations to avoid wetting and weakening of the foundation soils both during construction and after construction is complete.

4.4 Floor Slabs

The near surface or shallow subgrade soils encountered within the proposed building footprint generally consist of medium stiff to stiff silty clay and fill material. While the silty clay material is suitable for floor slab support, the fill material is not. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the floor slab subgrade, they must be undercut and replaced with well-compacted structural fill prior to construction of floor slabs.***

We recommend that all floor slabs be designed as "floating", that is, fully ground supported and not structurally connected to walls or foundations. This is to minimize the possibility of cracking and displacement of the floor slabs because of differential movements between the slab and the foundation. Although the movements are estimated to be within the tolerable limits for the structural safety, such movements could be detrimental to the slabs if they were rigidly connected to the foundations. Additionally, we recommend that all slabs should be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions.

The building floor slabs should be supported on a minimum 6 inch thick well-compacted granular base course (i.e. Indiana Department of Transportation (INDOT) No. 53 crushed stone) bearing on a suitably prepared subgrade (Refer to Section 5.0 *"Construction Considerations"*). The granular base course is expected to help distribute loads and equalize moisture conditions beneath the slab.

Provided that the recommendations above for floor slab design and construction are followed, a modulus of subgrade reaction, "K_{30}" value of 75 pounds per cubic inch (pci), is recommended for the design of ground supported floor slabs. It should be noted that the "K_{30}" modulus is based on a 30 inch diameter plate load empirical relationship.

4.5 Seismic Considerations

For structural design purposes, we recommend using a ***Site Classification of "C"*** as defined by the Indiana Building Code (modified 2012 International Building Code (IBC)). Furthermore, along with using a Site Classification of "C", we recommend the use of the

maximum considered spectral response acceleration and design spectral response acceleration coefficients provided in Table No. 2 below. Refer to Appendix "B" for *"Seismic Site Class Evaluation"* report summary.

Table No. 2: Seismic Design Spectral Response Acceleration Coefficients

Period (seconds)	Maximum Considered Spectral Response Acceleration Coefficient	Soil Factor	Design Spectral Response Acceleration Coefficient
0.2	S_S = 0.225 g	1.20	S_{DS} = 0.180 g
1.0	S_1 = 0.107 g	1.69	S_{D1} = 0.121 g

These values were obtained from the *"Earthquake Ground Motion Parameters"* program for seismic design, developed by the United States Geological Survey (USGS) Earthquake Hazard Program, utilizing latitude 39.175149° north and longitude 86.5534332° west as the designation for identifying the location of the parcel. Other earthquake resistant design parameters should be applied consistent with the minimum requirements of the Indiana Building Code.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

All areas that will support foundations, floors, pavements or newly placed structural fill must be properly prepared. All loose surficial soil or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include: frozen soil, relatively soft material, relatively wet soils, deleterious material, or soils that exhibit a high organic content.

Approximately 3 to 8 inches of loose surficial topsoil was encountered in the borings. The topsoil was measured at discrete locations as shown on the Boring Location Map (Figure No. 2) in Appendix "A". The topsoil thickness measured at the boring locations may or may not be representative of the overall average topsoil thickness at the site. Therefore, it is possible that the actual stripping depth could significantly vary from this data. The data presented should be viewed only as a guide to the minimum stripping depth that will be

required to remove organic material at the surface. Additional field exploration by *Patriot* would be required to provide an accurate estimate of the stripping depth. This limited data indicates that a minimum stripping depth will be required to remove the organic material at the surface, followed by the potential for additional stripping and/or scarification and recompaction as may be required to achieve suitable subgrade support. ***Additionally, if saturated conditions exist with the surface soils, light tracked equipment could be required to avoid pushing organics deeper into the suitable subgrade soils.*** A *Patriot* representative should verify the stripping depth at the time grading operations occur.

Prior to construction of floor slabs, pavements or the placement of new structural fill, the exposed subgrade must be evaluated by a Patriot representative; which will include proofrolling of the subgrade. Proofrolling should consist of repeated passes of a loaded, pneumatic-tired vehicle such as a tandem-axle dump-truck or scraper. The proofrolling operations should be observed by a *Patriot* representative, and the proofrolling vehicle should be loaded as directed by *Patriot*. Any area found to rut, pump, or deflect excessively should be compacted in-place or, if necessary, undercut and replaced with structural fill, compacted as specified in Section 5.3 *"Structural Fill and Fill Placement Control"*.

Care must be exercised during grading and fill placement operations. ***The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction.*** The contractor must exercise discretion when selecting equipment sizes and also make a concerted effort to control construction traffic and surface water while the subgrade soils are exposed. We recommend that heavy construction equipment (i.e. dump trucks, scrapers, etc.) be rerouted away from the building and pavement areas. If such problems do arise, the operations in the affected area should be halted and the *Patriot* representative contacted to evaluate the condition.

5.2 Sinkhole Remediation

The actual method used for the treatment of sinkholes is typically dependent on the depth to bedrock and the intended purpose of the area subjected to remediation. Several acceptable methods of treatment are discussed below.

If the depth to the top of bedrock is greater than 15 feet the following should be performed:

- Remove all debris from the hole

- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density

Please refer to Illustration A at the end of this report.

If the depth to the top of bedrock is less than 15 feet the following should be performed:

- Remove all debris from the hole
- Excavate to the top of the bedrock
- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place 1 foot of compacted crushed limestone (DGA), compacted to 100% of standard proctor maximum dry density
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density
- Or instead of crushed limestone and soil cap, place 1-foot reinforced concrete cap

Please refer to Illustrations B and C at the end of this report.

5.3 Foundation Excavations

Upon completion of the foundation excavations and prior to the placement of reinforcing steel, a *Patriot* representative should check the exposed subgrade to confirm that a bearing surface of adequate strength has been reached. Any localized soft soil zones encountered at the bearing elevations should be further excavated until adequate support soils are encountered. The cavity should be backfilled with structural fill as defined below, or the footing can be poured at the excavated depth. Structural fill used as backfill beneath footings should be limited to lean concrete, well-graded sand and gravel, or crushed stone placed and compacted in accordance with Section 5.3 *"Structural Fill and Fill Placement Control"*.

If it is necessary to support spread footings on structural fill, the fill pad must extend laterally a minimum distance beyond the edge of the footing. The minimum structural pad

width would correspond with a point at which an imaginary line extending downward from the outside edge of the footing at a 1H:2V (horizontal: vertical) slope intersects the surface of the natural soils. For example, if the depth to the bottom of excavation is 4 feet below the bottom of the foundation, the excavation would need to extend laterally beyond the edge of the footing at least 2 feet, as shown in Illustration "A" found at the conclusion of this report.

Excavation slopes should be maintained within all requirements set-forth by the Occupational Safety and Health Standards (OSHA), but specifically Section 1926 Subpart "P" – *"Excavations"*. We recommend that any surcharge fill or heavy equipment be kept at least 5 feet away from the edge of the excavation.

Construction traffic on the exposed surface of the bearing soil will potentially cause some disturbance of the subgrade and consequently loss of bearing capacity. However, the degree of disturbance can be minimized by proper protection of the exposed surface.

5.4 Structural Fill and Fill Placement Control

Structural fill, defined as any fill which will support structural loads, should be clean and free of organic material, debris, deleterious materials and frozen soils. Samples of the proposed fill materials should be tested prior to initiating the earthwork and backfilling operations to determine the classification, the natural and optimum moisture contents and maximum dry density and overall suitability as a structural fill. ***Structural fill should have a liquid limit less than 40 and a plasticity index less than 20.***

All structural fill beneath floor slabs, adjacent to foundations and over foundations, should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698). This minimum compaction requirement should be increased to 100 percent (%) of the maximum Standard Proctor dry density for fill supporting footings, provided these are designed as outlined Section 4.0 *"Design Recommendations"*.

Structural fill supporting, around and over utilities should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698) for utilities underlying structural areas (i.e. buildings, pavements, sidewalks, etc.). However, the minimum compaction requirement can be reduced for backfill around and over the utilities to 90 percent (%) of the maximum Standard Proctor dry density where utilities underlie greenbelt areas (i.e. grassy lawns, landscaping, etc.). It is recommended that a

clean well-grade granular material be utilized as the bedding material, as well as the backfill material around and over the utility lines.

In cut areas, where pavement sections are planned, the upper 10 inches of subgrade should be scarified and compacted to a dry density of at least 100 percent (%) of the Standard Proctor maximum dry density (ASTM D-698). Any grade-raise fill placed within 1 foot of the base of the pavement section should also be compacted to at least 100 percent (%) of the Standard Proctor maximum dry density. This can be reduced to 95 percent (%) for structural fill placed more than 1 foot below the base of the pavement section.

To achieve the recommended compaction of the structural fill, we suggest that the fill be placed and compacted in layers not exceeding 8 inches in loose thickness (the loose lift thickness should be reduced to 6 inches when utilizing small hand compactors) and within the range of 2 percentage (%) points below or above the optimum moisture content value. All fill placement should be monitored by a *Patriot* representative. ***Each lift should be tested for proper compaction at a frequency of at least one (1) test every 2,500 square feet (ft^2) per lift for the building areas, at least one (1) test every 10,000 square feet (ft^2) per lift for the parking and roadway areas, and at a frequency of at least one (1) test for every 50 lineal feet of utility installation.***

5.5 Groundwater Considerations

Groundwater was observed during our field activities at depths between 13 feet below the existing ground surface (Refer to Section 3.3 *"Groundwater Conditions"*); which is expected to be below the anticipated foundation excavation depths. Depending on seasonal conditions, localized and sporadic groundwater infiltration may occur into the building foundation excavations on this site.

Groundwater inflow into shallow excavations **above** the groundwater table is expected to be adequately controlled by conventional methods such as gravity drainage and/or pumping from sumps. More significant inflow can be expected in deeper excavations **below** the groundwater table requiring more aggressive dewatering techniques, such as well or wellpoint systems. For groundwater to have minimal effects on the construction, foundation excavations should be constructed and poured in the same day, if possible.

6.0 EXPLORATIONAL PROCEDURES

6.1 Field Work

A total of six (6) soil borings were drilled, sampled, and tested at the project site on April 17, 2024 at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". The soil borings were drilled to depths of 20 feet in the proposed building area. All depths are given as feet below the existing ground surface.

The borings were advanced using 3¼ inch inside diameter hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2 inch outside diameter by $1^{3}/_{8}$ inch inside diameter split-spoon sampler was driven a total of 18 inches with the number of blows of a 140 pound hammer falling 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5 feet intervals, beginning at a depth of 1 foot below the existing surface grade, extending to a depth of 10 feet, and at 5 feet intervals thereafter to the termination of the boring.

Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings prior to demobilization for safety considerations.

Upon completion of the boring program, all of the samples retrieved during drilling were returned to *Patriot*'s soil testing laboratory where they were visually examined and classified. A laboratory-generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual examination. Test boring logs and a description of the classification system are included in Appendix "A" in this report. Indicated on each log are: the primary strata encountered, the depth of each stratum change, the depth of each sample, the Standard Penetration Test results, groundwater conditions, and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

6.2 Laboratory Testing

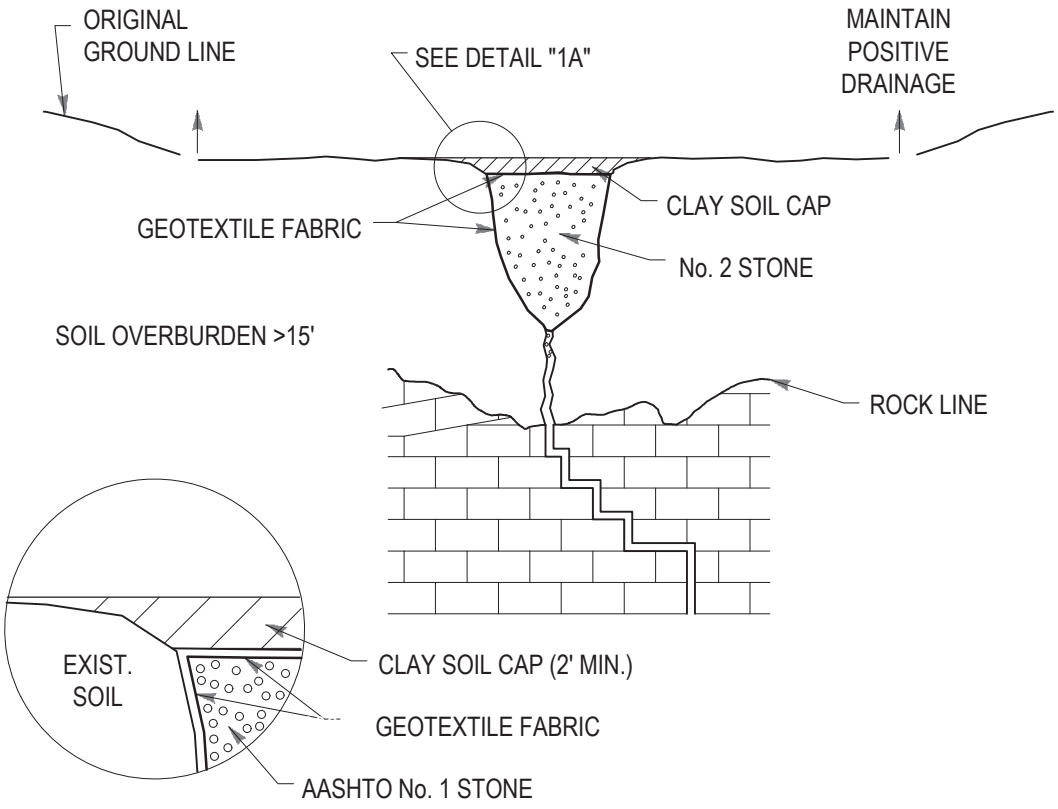
Representative samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. Laboratory analysis included: natural moisture content determinations (ASTM D 2216) and an

estimate of the unconfined compressive strength (q_u) of the cohesive soil samples utilizing a calibrated hand penetrometer (q_p) were obtained. The results of laboratory tests are summarized in Section 3.2 *"General Subsurface Conditions"*. Soil descriptions on the boring logs are in accordance with the Unified Soil Classification System (USCS).

7.0 ILLUSTRATIONS

See Illustrations "D" and "E" on the following pages. These illustrations are presented for reference for the remediation and backfill of sinkholes presented in Section 5.2.

See Illustrations "D" and "E" on the following pages. These illustrations are presented to further visually clarify several of the construction considerations presented in Section 5.3 *"Foundation Excavations"*.



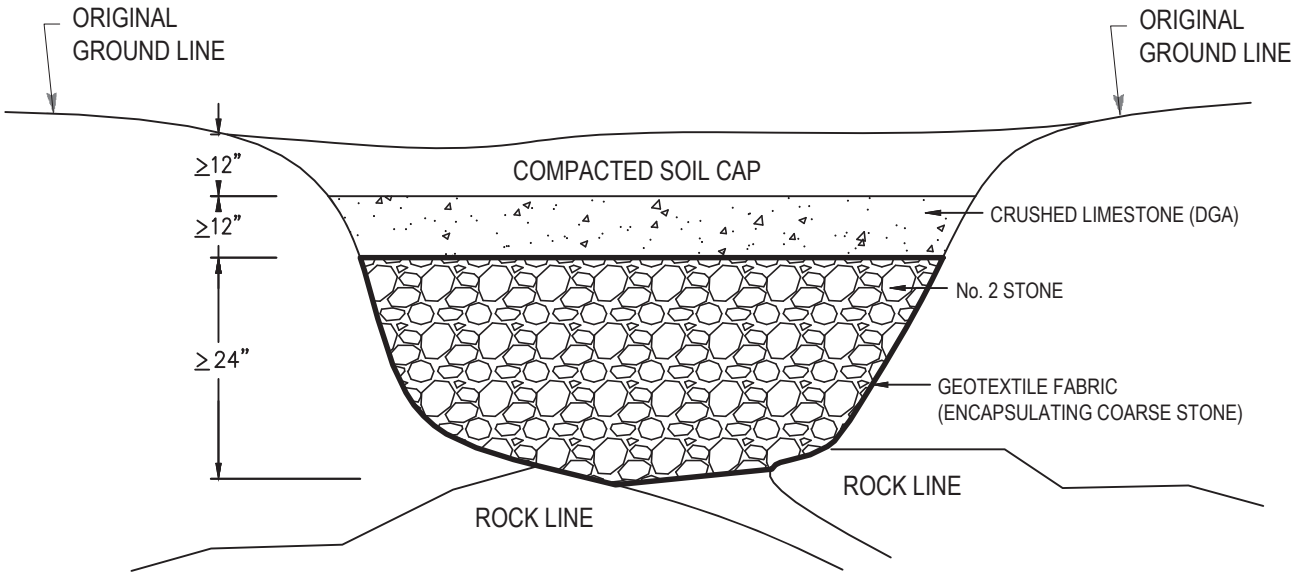
DETAIL "1A"

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration A

Treatment Method for
Deep Sink Holes



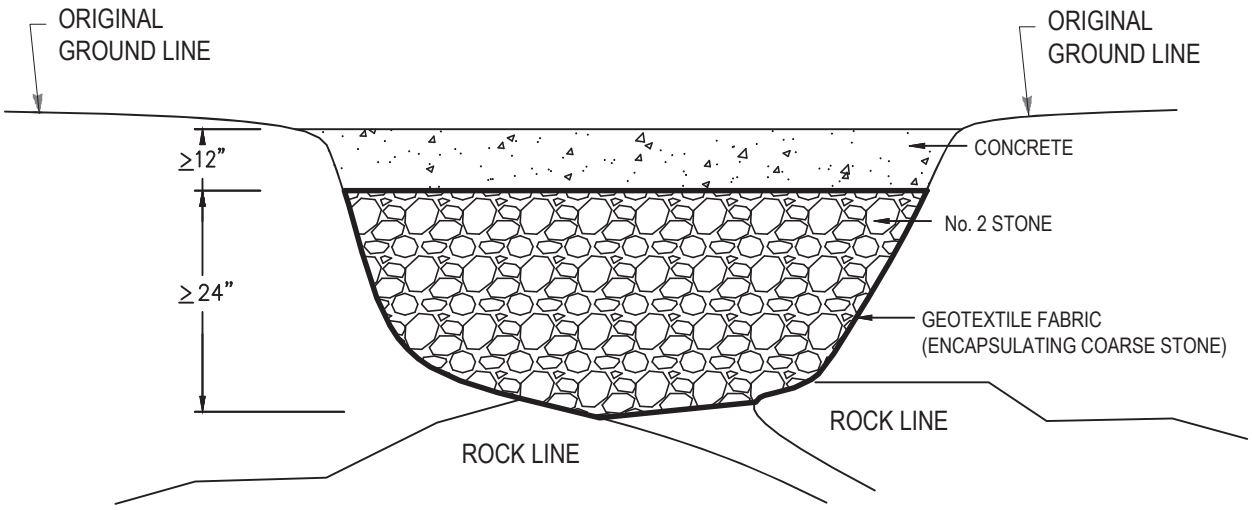
SOIL OVERBURDEN <15'

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration B

Treatment Method for Sink Holes



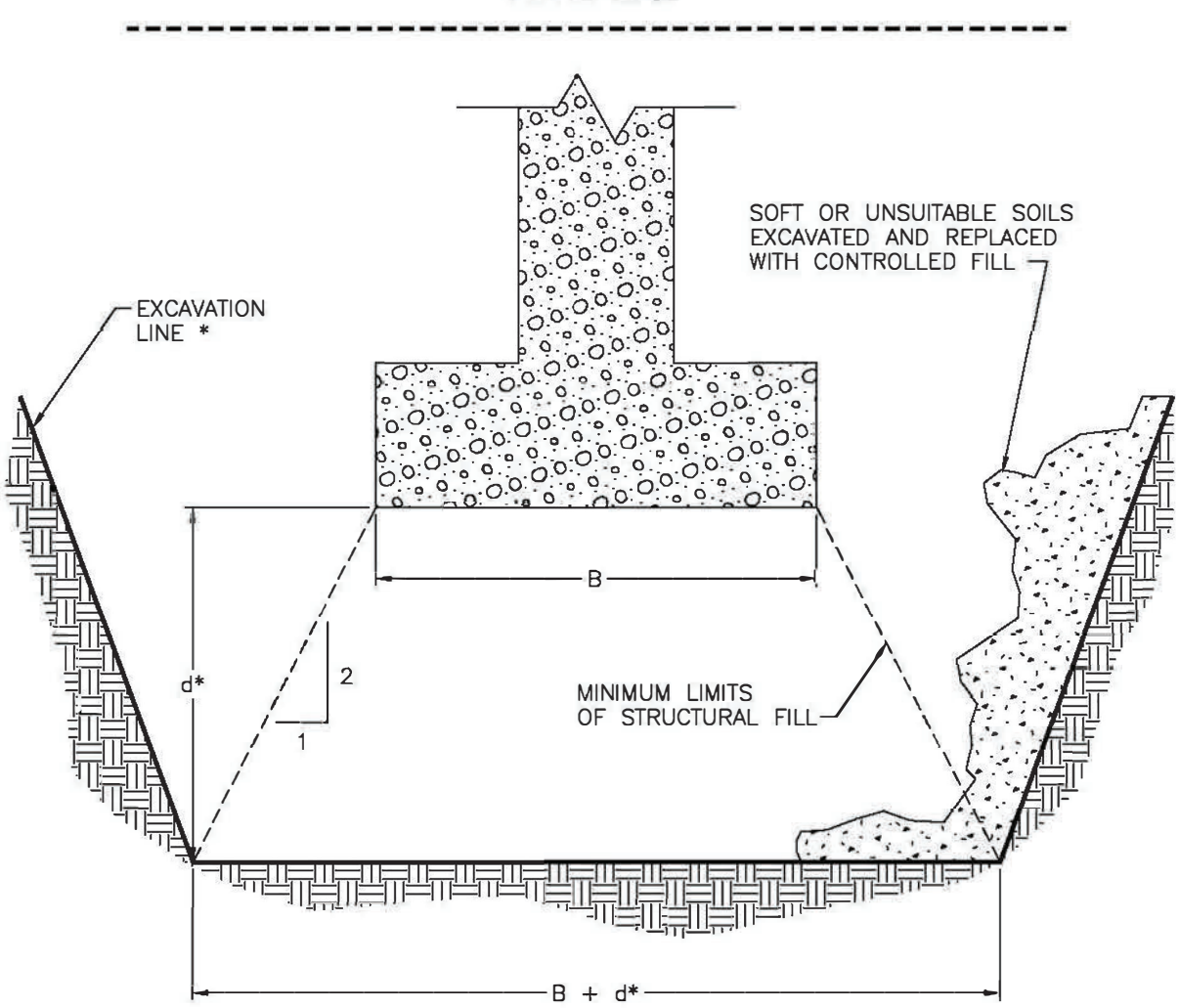
SOIL OVERBURDEN <15'

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration C

Treatment Method for Sink Holes



*d IS DEPTH TO SUITABLE SOILS

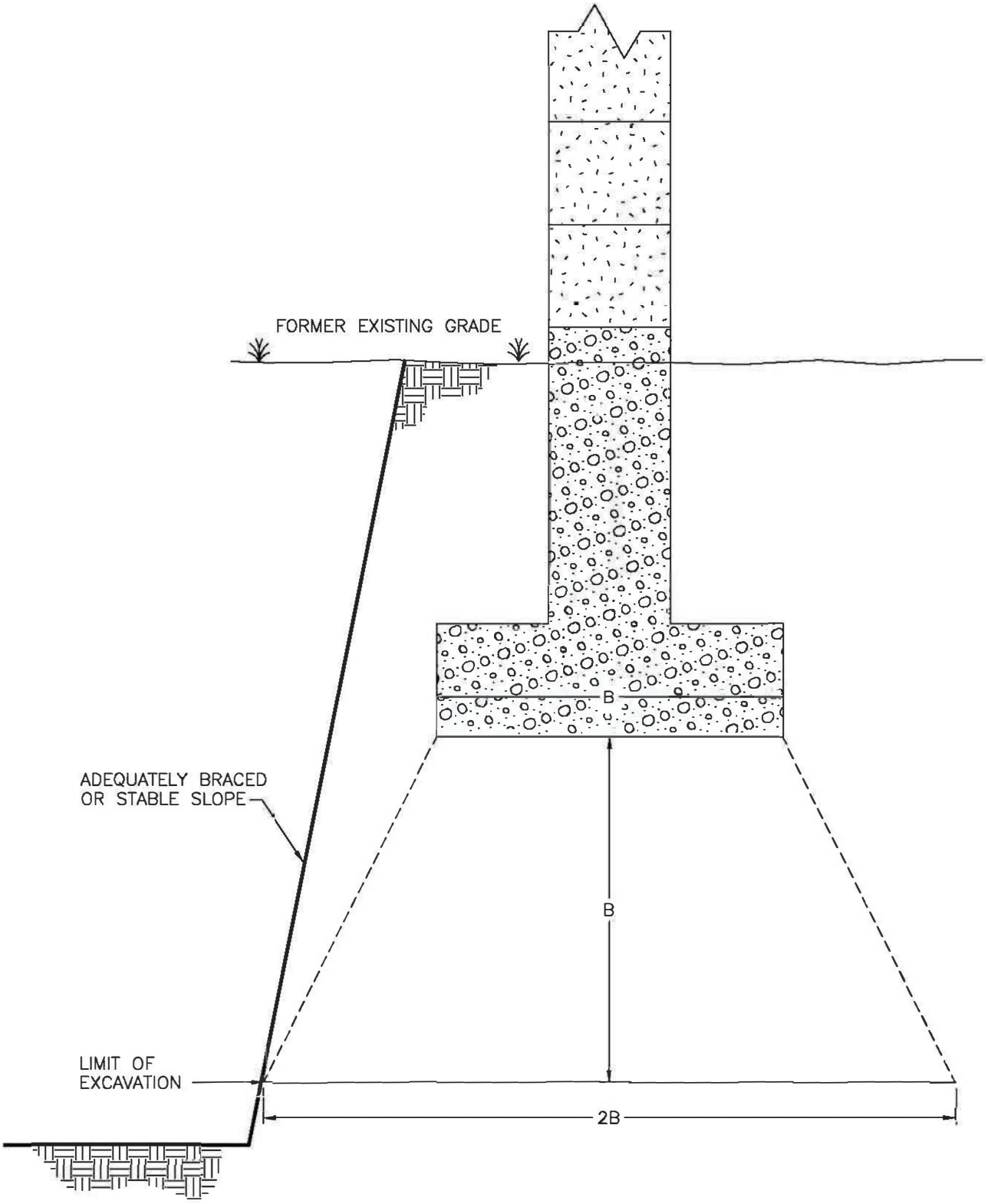
* IN COMPLIANCE WITH OSHA STANDARDS

PATRIOT ENGINEERING
and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical
and Materials Engineers

Excavation for Footings
In an Area of Fill
ILLUSTRATION D

job. no.:

figure:



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and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical
and Materials Engineers

Excavation Near Existing
In Use Foundations
ILLUSTRATION E

job. no.:

figure:

APPENDIX A

SITE VICINITY MAP (FIGURE NO. 1)

BORING LOCATION MAP (FIGURE NO. 2)

BORING LOGS

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

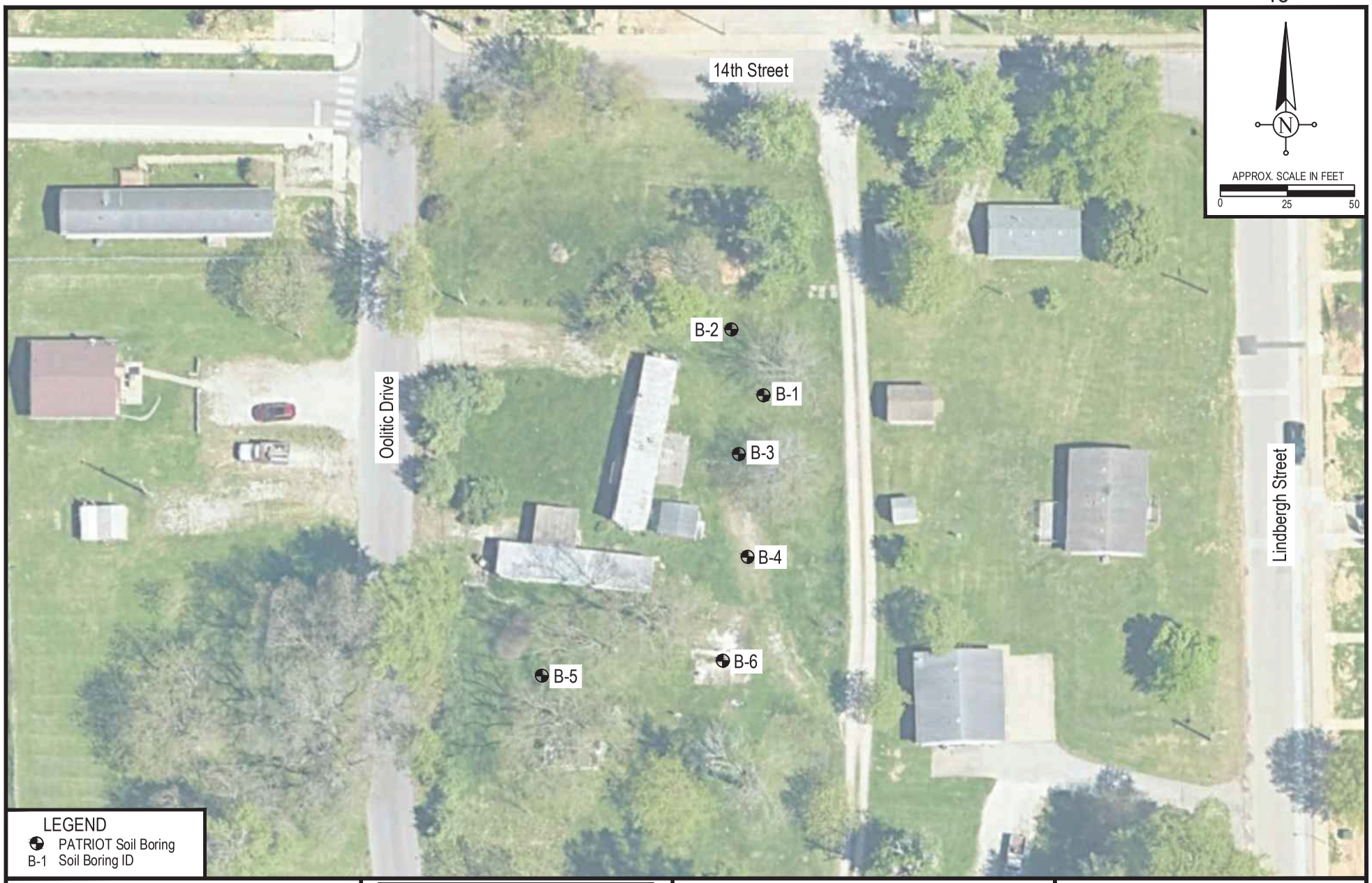
Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number:24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 1

Site Vicinity Map



Patriot Engineering & Environmental, Inc.

NOTES:
1. Boring locations were staked by PATRIOT. All locations are shown as approximate.
2. All locations were determined in the field with references to existing landmarks.
3. Image Source: Google Earth
4. Scale as shown.

Project: Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number: 24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 2

Soil Boring Location Map

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-1

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 881 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.20"N
Drilling Method	: HSA	Longitude	: 86°33'11.58"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 881	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
					Red, moist to very moist, stiff to hard, SILTY CLAY	1	100	4/4/7	2.3	24	
						2	67	4/6/7	1.9	23	
5	875		CL			3	33	6/10/13	2.7	24	
						4	94	6/7/8	4.5	22	Boring caved to 8.5 feet upon auger removal.
10	870										
					Gray, highly weathered, LIMESTONE	5	17	50-3"			Auger refusal encountered at 13.5 feet.
15	865				Splitspoon refusal encountered at 13.8 feet.						Groundwater was not encountered during drilling, nor upon completion.
20	860										
25											
	855										

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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-2

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 883 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.44"N
Drilling Method	: HSA	Longitude	: 86°33'11.73"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 883	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	880		CL		Brown, very moist, stiff, SILTY CLAY with trace gravel	1	100	4/5/7		26	
5			CL		Red, very moist, stiff to very stiff, SILTY CLAY	2	89	4/7/8	2.5	26	Boring caved to 5 feet upon auger removal.
	875		CH		Red, very moist, stiff to very stiff, CLAY	3	100	4/6/8	3.0	37	
10						4	50	4/18/50-4"		28	
					Gray, highly weathered LIMESTONE						
	870				Auger refusal encountered at 12 feet						Groundwater was not encountered during drilling, nor upon completion.
15											
	865										
20											
	860										
25											

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-3

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.98"N
Drilling Method	: HSA	Longitude	: 86°33'11.69"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
			CL		Red, moist, medium stiff, SILTY CLAY	1	17	9/5/3		21	Boring caved to 2 feet upon auger removal.
	875										
			CL		Red, moist, medium stiff, SILTY CLAY with some gravel and asphalt (FILL)	2	44	1/3/3		21	
5											
			CH		Red, very moist, hard, CLAY with trace limestone	3	33	4/50-4"		40	
	870										
					Gray, highly weathered, LIMESTONE	4	44	50-4"			
10											
	865				Auger refusal encountered at 12 feet.						Groundwater was not encountered during drilling, nor upon completion.
15											
	860										
20											
	855										
25											

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-4

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 877 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.60"N
Drilling Method	: HSA	Longitude	: 86°33'11.65"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 877	USCS	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0			TOPSOIL (3")						
	875	CL	Brown, slightly moist, stiff, SILTY CLAY with some asphalt (FILL)	1	44	4/4/6		16	
			ASPHALT and GRAVEL (FILL)	2	72	11/13/6		6	
5									
	870		Red, very moist, stiff to very stiff, CLAY	3	50	4/6/7	3.9	28	Boring caved to 6 feet upon auger removal.
				4	72	8/11/9	3.6	31	
10									
	865	CH							
				5	100	7/13/10		27	
15									
	860								
				6	72	7/10/12		26	
20			Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
	855								
25									

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Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-5

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.17"N
Drilling Method	: HSA	Longitude	: 86°33'12.62"W

Water Levels
- During Drilling - 13.0 feet
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (5")						
					Brown, moist to very moist, soft to medium stiff, SILTY CLAY with trace gravel and organics (FILL)	1	33	1/1/24		21	
	875		CL			2	56	2/2/2		19	
5											Boring caved to 5 feet upon auger removal.
					Brown to Gray, moist to very moist, medium stiff to stiff, SILTY CLAY	3	33	4/4/4		24	
	870					4	39	3/3/4		21	
10											
	865	▼	CL			5	100	1/3/3		29	
15											
	860										
20						6	100	4/6/6		21	
					Boring terminated at 20 feet.						
	855										
25											

PATRIOT ENGINEERING and Environmental Inc.
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Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-6

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.23"N
Drilling Method	: HSA	Longitude	: 86°33'11.77"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (5")						
			CL		Brown, moist, stiff, SILTY CLAY with trace asphalt (FILL)	1	94	4/5/5		21	
	875					2	56	4/5/5			
5			CL		Brown, moist, medium stiff, SILTY CLAY with trace asphalt (FILL)	3	33	4/4/3		19	
	870										Boring caved to 8 feet upon auger removal.
			CL		Brown, moist, medium stiff, SILTY CLAY with some gravel and brick (FILL)	4	17	1/3/2			
10											
	865										
15			CH		Red, very moist, stiff to hard, CLAY	5	67	9/11/12	3.3	32	
	860										
20						6	100	4/9/12	3.0	37	
	855				Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
25											

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON-COHESIVE SOILS
(Silt, Sand, Gravel, and Combinations)

Density	Field Identification (SPT Blows/ft)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 51

Grain Size Terminology

Soil Fraction	Particle Size	US Standard Sieve Size
Boulders	> 12 inches	> 12 inches
Cobbles	3 - 12 inches	3 - 12 inches
Gravel: Coarse	¾ - 3 inches	¾ - 3 inches
Small	4.76 mm - ¾ inch	No. 4 - ¾ inches
Sand: Coarse	2.00 - 4.76 mm	No. 10 - No. 4
Medium	0.42 - 2.00 mm	No. 40 - No. 10
Fine	0.074 - 0.42 mm	No. 200 – No. 40
Silt	0.005 - 0.074 mm	< No. 200
Clay	< 0.005 mm	< No. 200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/ft^2)	Field Identification (SPT Blows/ft)
Very Soft	Less than 0.25	0 - 2
Soft	0.25 – < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 -15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification: Provided on Boring Logs are made by visual inspection.

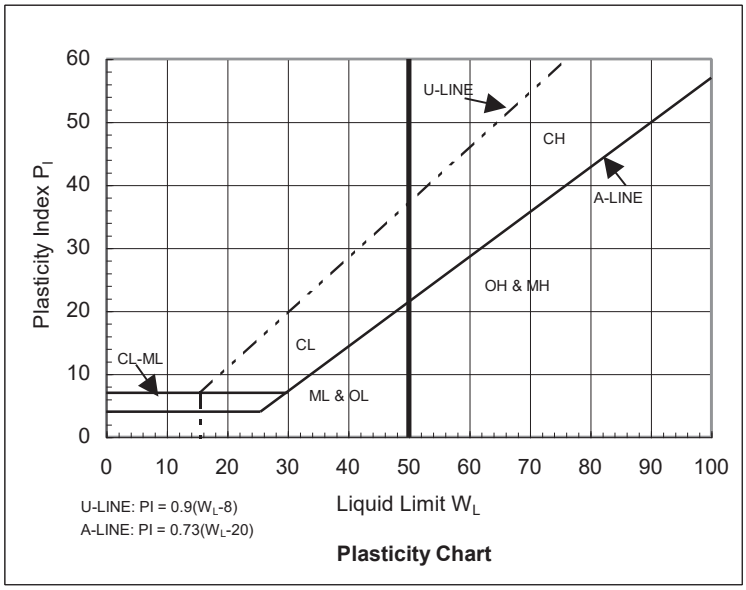
Standard Penetration Test: Driving a 2 inch outer-diameter (O.D.) by 1⅜ inch inner-diameter (I.D.) split-spoon sampler a total of 18 inches into undisturbed soil with the number of blows of a 140 pound hammer free-falling a distance of 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the "N"-value (or blow-count).

Strata Changes: In the column "Descriptions" on the Boring Logs the horizontal lines represent strata changes. A solid line (———) represents an observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater: Observations were made at the times indicated on the Boring Logs. Fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. *Groundwater symbols*: (▼)-observed groundwater level and/or elevation during drilling; (∇)-observed groundwater level and/or elevation upon completion of boring.

Unified Soil Classification System (USCS)

Major Divisions			Group Symbol		Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM	d u a l	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols	
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_c > 3$)		
		Sands with fines (appreciable amount of fines)	SM	d u a l	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols	
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (liquid limit >50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays or high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT		Peat and other highly organic soils			



Plasticity Chart

APPENDIX B

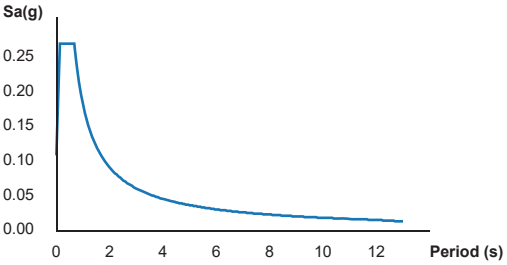
SEISMIC SITE CLASS EVALUATION

Hazards by Location

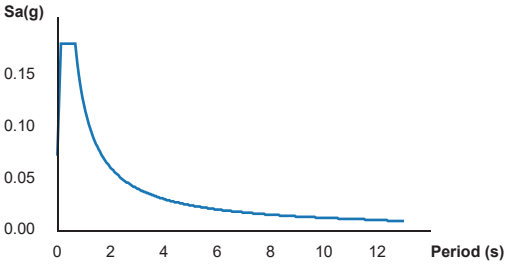
Search Information

Address:	922 N Oolitic Dr, Bloomington, IN 47404, USA
Coordinates:	39.175149, -86.5534332
Elevation:	879 ft
Timestamp:	2024-05-03T13:50:55.486Z
Hazard Type:	Seismic
Reference Document:	IBC-2012
Risk Category:	II
Site Class:	C

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.225	MCE_R ground motion (period=0.2s)
S_1	0.107	MCE_R ground motion (period=1.0s)
S_{MS}	0.269	Site-modified spectral acceleration value
S_{M1}	0.181	Site-modified spectral acceleration value
S_{DS}	0.18	Numeric seismic design value at 0.2s SA
S_{D1}	0.121	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	1.693	Site amplification factor at 1.0s
CR_S	0.9	Coefficient of risk (0.2s)
CR_1	0.854	Coefficient of risk (1.0s)
PGA	0.107	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.128	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	0.225	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.25	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.107	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.125	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)

PGAd	0.6	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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APPENDIX C

GENERAL QUALIFICATIONS

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

GENERAL QUALIFICATIONS

of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

This report may not contain sufficient information for purposes of other parties or other uses. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report. Should there be any significant differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The recommendations provided herein were developed from the information obtained in the test borings, which depict subsurface conditions only at specific locations. The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. The nature and extent of variations between borings may not become evident until the time of construction. If, after performing on-site observations during construction and noting the characteristics of any variation, substantially different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that Patriot be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

BLOOMINGTON BOARD OF ZONING APPEALS **CASE #: V-13-24/ VAR-2024-04-0030**
STAFF REPORT **DATE: May 23, 2024**

Location: 918 N Oolitic Dr (parcel # 53-05-32-201-106.058-005) (Lot 58 of Forest Homes)

PETITIONER: Ruby Creek Homes
11990 E 1400 N, Oden, IN 47562

CONSULTANTS: Melvin Graber
11990 E 1400 N, Oden, IN 47562

REQUEST: Variance from Karst Preservation standards to allow disturbance within 25' of the last closed contour of a karst feature for a property in the Residential Medium Lot (R2) zoning district.

REPORT: This 0.193-acre property is located at 918 N Oolitic Dr. The property is zoned Residential Medium Lot (R2). Surrounding zones are all Residential Medium Lot (R2) and surrounding land uses are all Dwelling, Single Family (detached).

Previous to the current owner, this lot of record, along with the Forest Homes Lots 57 and 59 (914 and 922 N Oolitic), were owned by the same owner and two mobile homes sat on all three lots for many years.

There is a karst feature, a sinkhole, located on this property. Existing elevations on this site range from 872 feet to 876 feet and the lowest portion of the sinkhole is on the south and southwest portions of this property. Evidence of makeshift flood control techniques and pumps were found on the site, demonstrating that the property owners experienced flooding on site. There is currently no stormwater infrastructure at or near this site.

Chapter 4 of the Unified Development Ordinance (UDO), Title 20 of the Bloomington Municipal Code) states that no land-disturbing activity, mowing, or temporary or permanent structure shall be allowed within the sinkhole nor within 25 feet of the last closed contour of the sinkhole. Title 20 of the UDO defines the sinkhole as the last closed contour line of the feature on the City's geographic information system. Historic contour mapping shows that this entire property located at 918 N Oolitic falls within the last closed contours of the karst feature, which is at an elevation of 882 feet, which means that according to the UDO, the entire lot cannot be disturbed. This lot contains the lowest point a sinkhole that covers multiple properties. Since this entire site lies within the area shown to be within the last closed contour of the karst feature, a variance must be granted to allow any disturbance on this property.

The petitioner is requesting a variance from the karst preservation standards to allow disturbance within 25' of the last closed contour of the karst feature.

As part of this variance request, a report of geotechnical engineering exploration was submitted. The report confirmed that a sinkhole is present on the site and it provided information about soil

composition in two locations on this property through analysis of soil borings. The report also provided sinkhole remediation methods of treatment and construction recommendations for placing a single family structure on the site.

CRITERIA AND FINDINGS FOR DEVELOPMENT STANDARDS VARIANCE
20.06.080(b)(3)(E) Standards for Granting Variances from Development Standards:

A variance from the development standards of the Unified Development Ordinance may be approved only upon determination in writing that each of the following criteria is met:

1) *The approval will not be injurious to the public health, safety, morals, and general welfare of the community.*

   PROPOSED FINDING: The granting of the variance may be injurious to the public health, safety, morals, or general welfare of the community. A number of structures have existed in and around this karst feature for many years with no collapse. Building at the lowest point of the sinkhole increases the likelihood of local flooding. However, proper testing of and restoration of the site will be required before building construction is allowed in order to maximize water infiltration on the site and ensure that water is not diverted off site, and to make sure that the site is safe for construction.

2) *The use and value of the area adjacent to the property included in the Development Standards Variance will not be affected in a substantially adverse manner.*

   PROPOSED FINDING: Adverse impacts to the use and value of surrounding properties as a result of the requested variance are possible if proper mitigation is not completed. The majority of this property is located in the lowest portion of the area, is most susceptible to flooding and is a collecting point for runoff from several properties. Current site elevation conditions show that the portions of the karst feature that are most sensitive are found on this property. Sinkhole remediation at this site will be required with approvals to building at 914 and 922 N Oolitic - the properties north and south adjacent to this site. If the conditions of approval included are successfully completed, the granting of the variance should not have adverse impacts on the use and value of surrounding properties.

3) *The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the Development Standards Variance will relieve the practical difficulties.*

   PROPOSED FINDING: The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property because it renders the entire site unbuildable. There has been development within the last closed contour of this feature for a number of years without any indications of negative impact. The practical difficulties are peculiar to the property in question because it is uncommon for an entire property to be located within a UDO-defined sinkhole, but because the properties in this area

are smaller, the extent of the last closed contour of the sinkhole renders the entire site unusable.

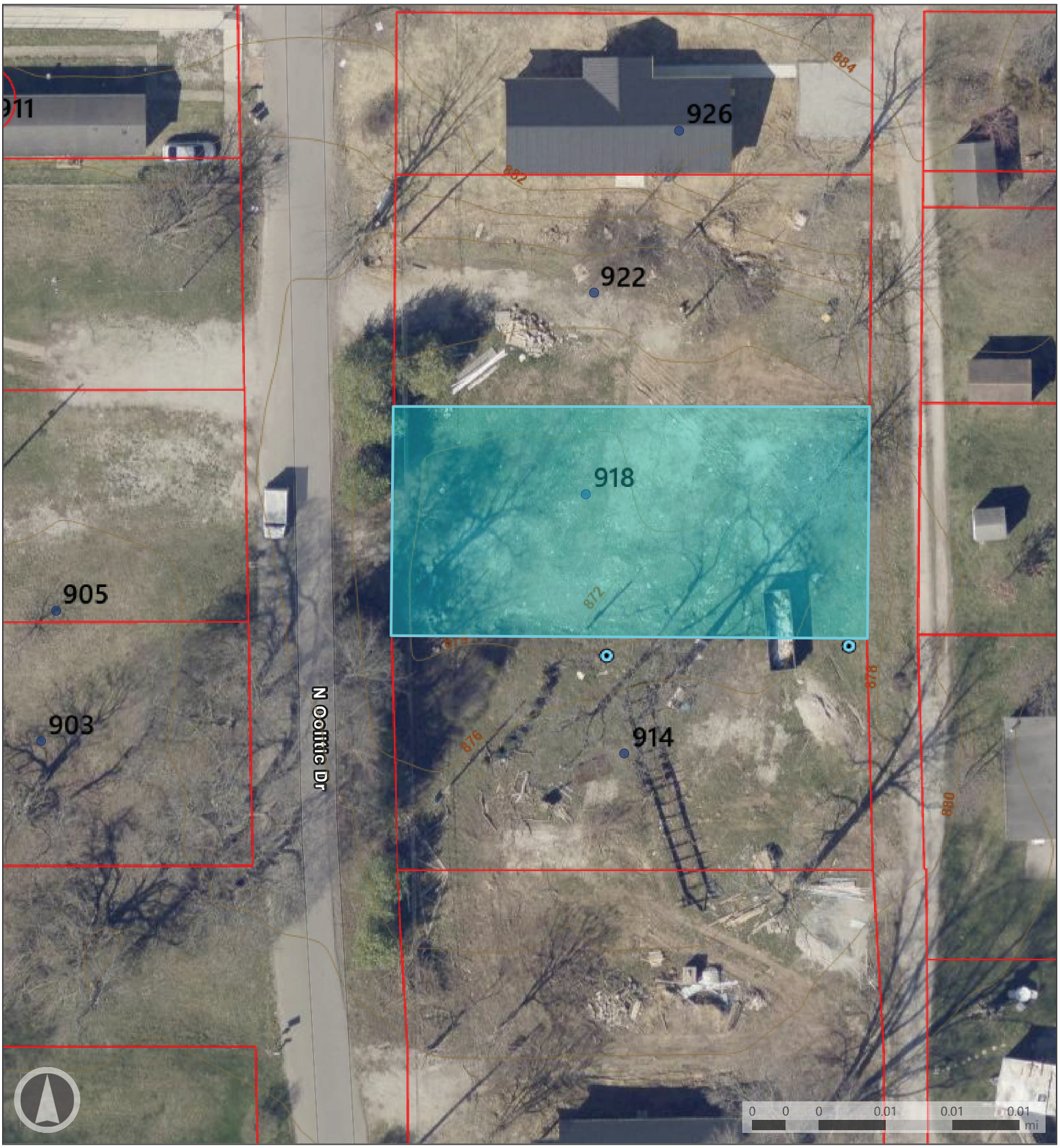
RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopt the proposed findings and approve V-13-24/ VAR-2024-04-0030.

1. Development of this lot is limited to the east half of the lot in order to maximize the area of land present between development and movement of water toward the sinkhole.
2. Implementation of sinkhole remediation as outlined in the attached geotechnical report, is required – at all three properties (914, 918 and 922 N Oolitic) - before any Certificate of Zoning Compliances will be issued.
3. Submission of a drainage and water flow analysis post-sinkhole remediation is required before a Certificate of Zoning Compliance will be issued. The report must be approved by City of Bloomington Planning & Transportation and Utility Departments.
4. Implementation of design and construction recommendations provided in the attached geotechnical report is required before a Certificate of Zoning Compliance will be issued.
5. Testing of soil and water contamination testing and provision of any necessary remediation identified related to those tests is required before a Certificate of Zoning Compliance will be issued.
6. A Zoning Commitment shall be recorded indicating the presence of the karst feature and describing the Karst Conservancy Easement before a Certificate of Zoning Compliance will be issued.

City of Bloomington

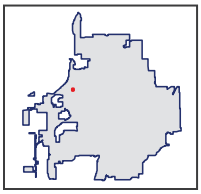
Context Aerial

V-13-24/ VAR-2024-04-0030



Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary

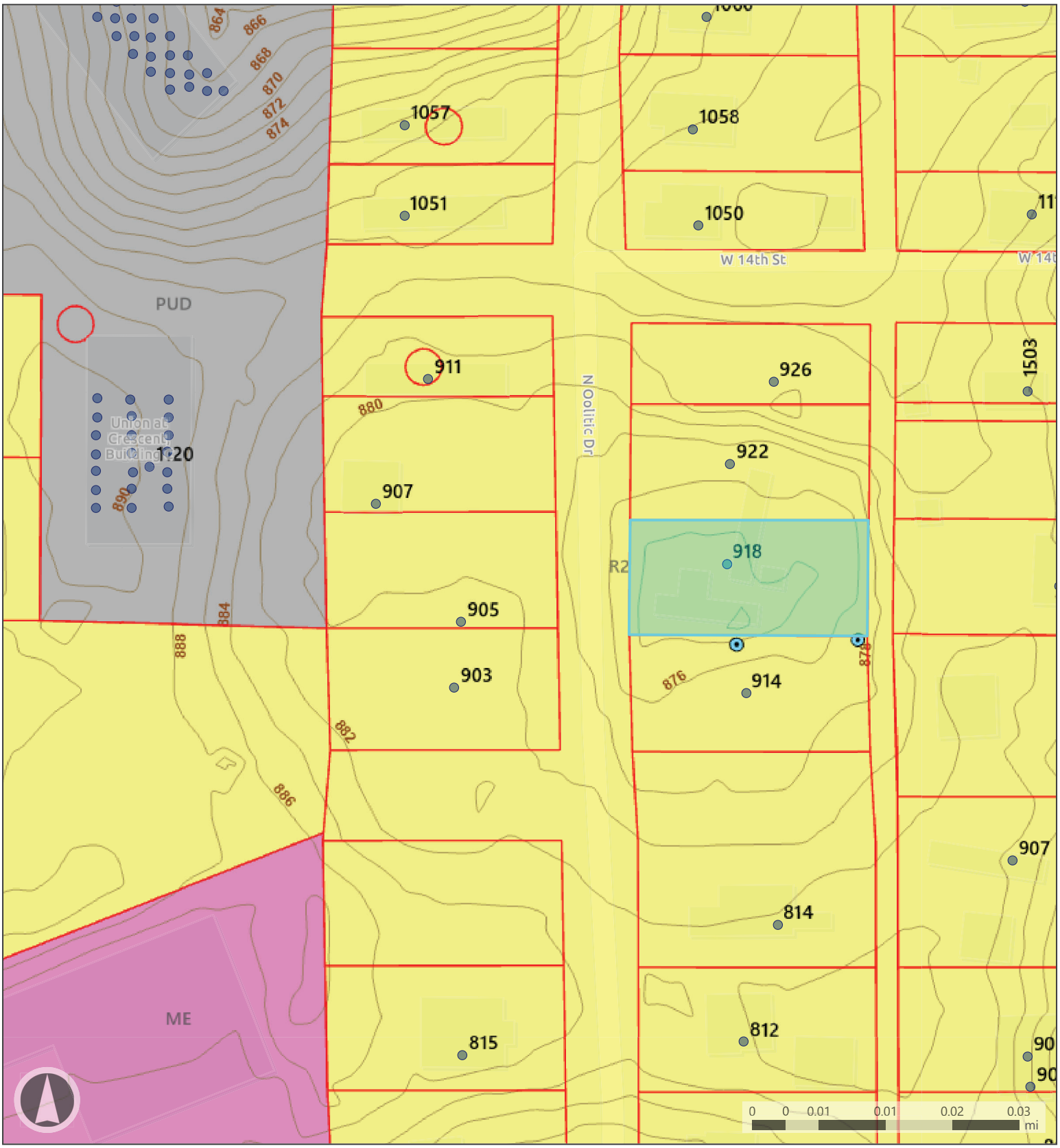


Created: 5/17/2024 *Map By: Katie Gandhi*

City of Bloomington

Location Map

V-13-24/ VAR-2024-04-0030

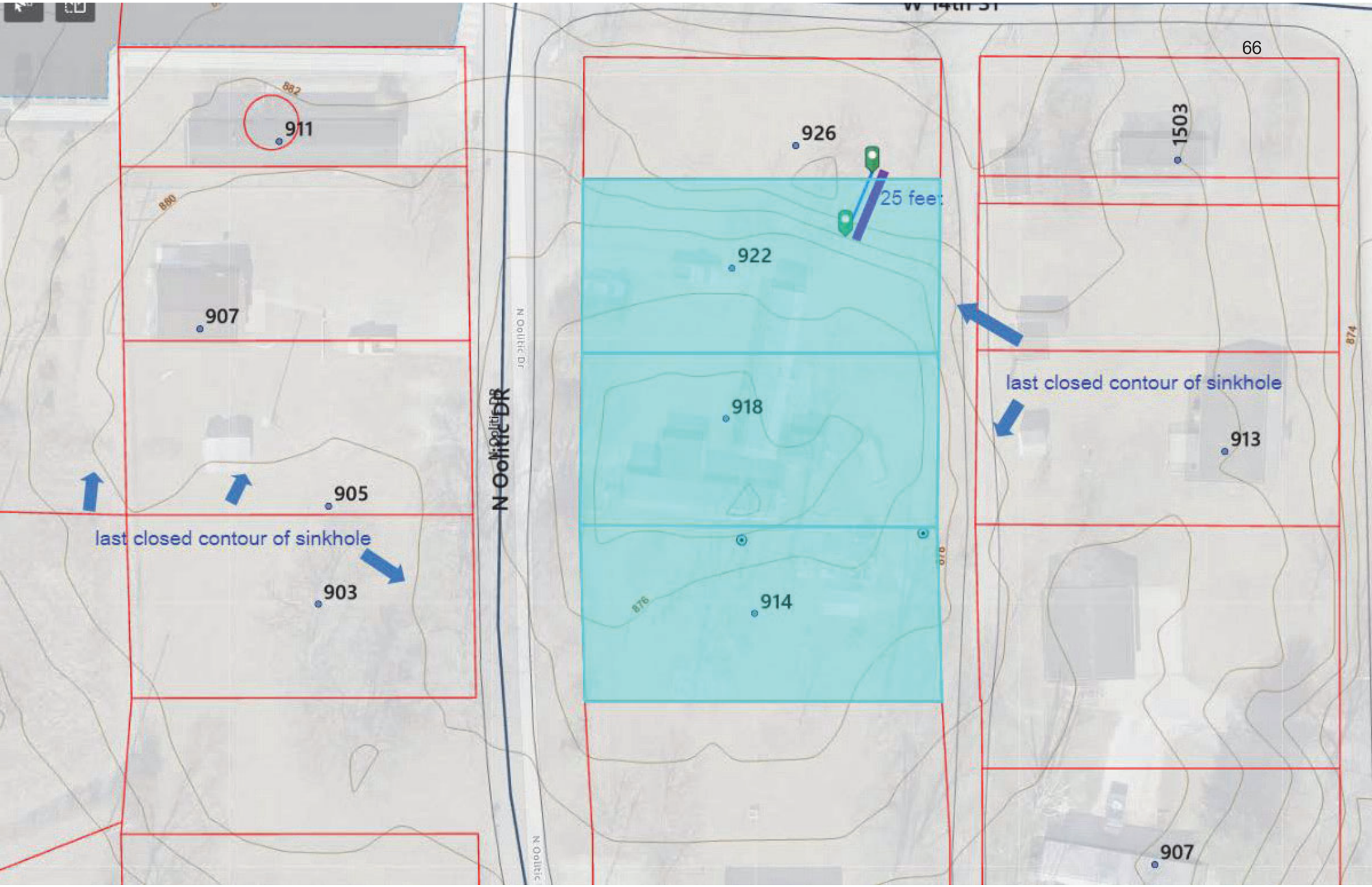


Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary
- Mixed-Use Employment
- Planned Unit Development
- Residential Medium Lot

Created: 5/17/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.


911
907
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914
1503
913
907
25 fee
last closed contour of sinkhole
last closed contour of sinkhole
N Oolitic DR
882
880
876
874

To Whom it may concern,

Ruby Creek Homes LLC (RCH) is requesting a variance from code UDO 20.04.030(g) Pursuant to Indiana Code 36-7-4-918.5.

Project Location

914, 918, 922 N Oolitic Dr.
(See Attached Survey)

Scope of Project

In 2023, 2 delapitated homes were removed from said properties (Demo Permit #s R-23-610, R-23-612) for the:

Purpose of New Home Construction

See Attached Site Plan

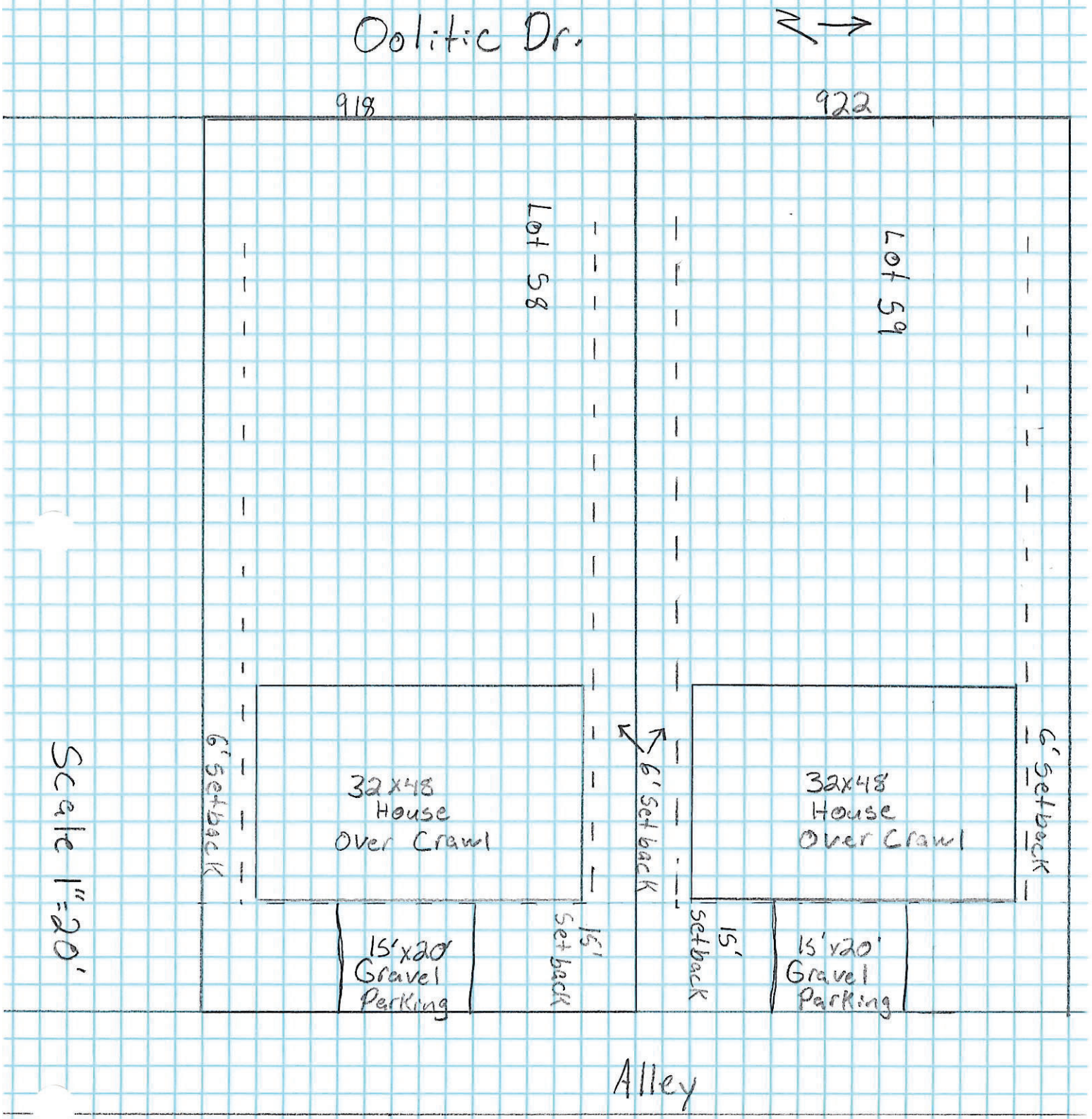
Difficulties

The strict application of UDO 20.04.030(g) renders the entire properties undevelopable, for which use it was previously intended. See Attached - Forrest Homes Development Recording 1927
Granting the requested Variance would:
Improve neighboring Property values
And would be an asset rather than a liability to public health safty and general welfare of the community by providing much needed and deficiant "Affordable Housing".

Site Plans for New Home Const.

922, 918 Oolitic Drive, Lots 58, 59

staff note: these plans will likely need to change according to any variance conditions that are approved -KAG



staff note: these plans will likely need to change according to any variance conditions that are approved -KAG

Camera 3

New Plans For::::

Maple - C

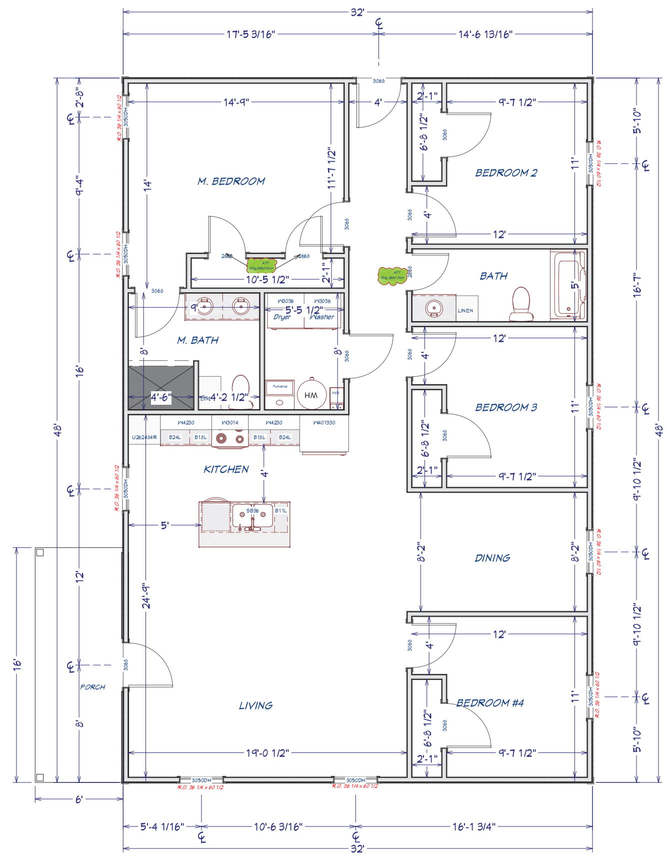
Project Overview

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Edon, IN 47362
574-668-4538
kwagler88@sbcglobal.net

DATE:
12/01/02/23

SCALE:

SHEET:
P-1



LIVING AREA
1529 SQ FT

1st Floor

FRAMING NOTES :::::::::::

ALL EXTERIOR WALLS ARE SHOWN AS 4" WALLS UNLESS NOTED OTHERWISE
ALL INTERIOR WALLS ARE SHOWN AS 3 1/2" WALLS UNLESS NOTED OTHERWISE
97 1/8" WALLS UNLESS NOTED OTHERWISE
ALL EXTERIOR MEASUREMENTS TO O.S.B.
ALL INTERIOR MEASUREMENTS TO FACE OF STUD
WINDOW R.O. INCLUDED FOR SILVERLINE WINDOWS
ALL HEADER HEIGHTS AT 83" UNLESS NOTED OTHERWISE

New Plans For::::

Maple - C

DRAWINGS PROVIDED BY:
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Odon In 47562
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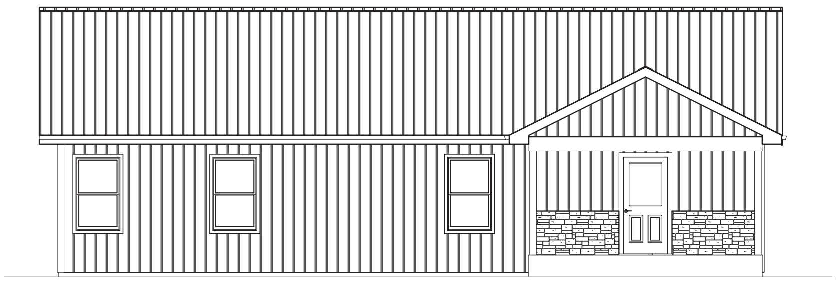
khwagler88@sle.email

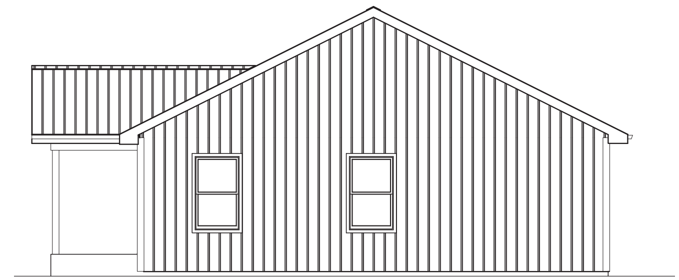
DATE: 12 01 02/ 23

SCALE:

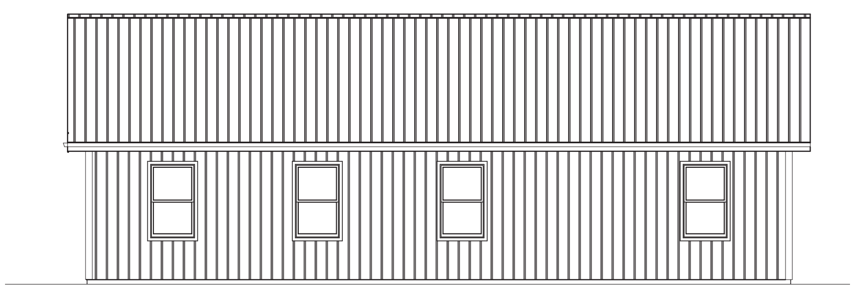
SHEET:



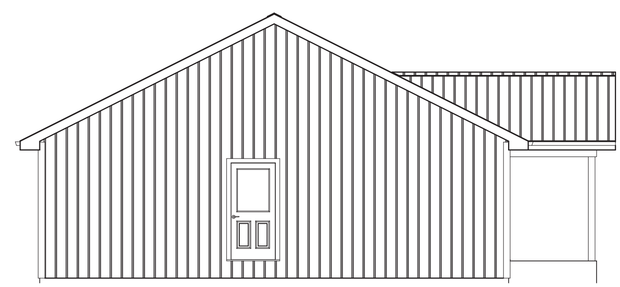
Elevation 4



Elevation 1



Elevation 3



Elevation 2

New Plans For::::

Maple - C

DRAWINGS PROVIDED BY:
Ken Wagler
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Odon In 47562
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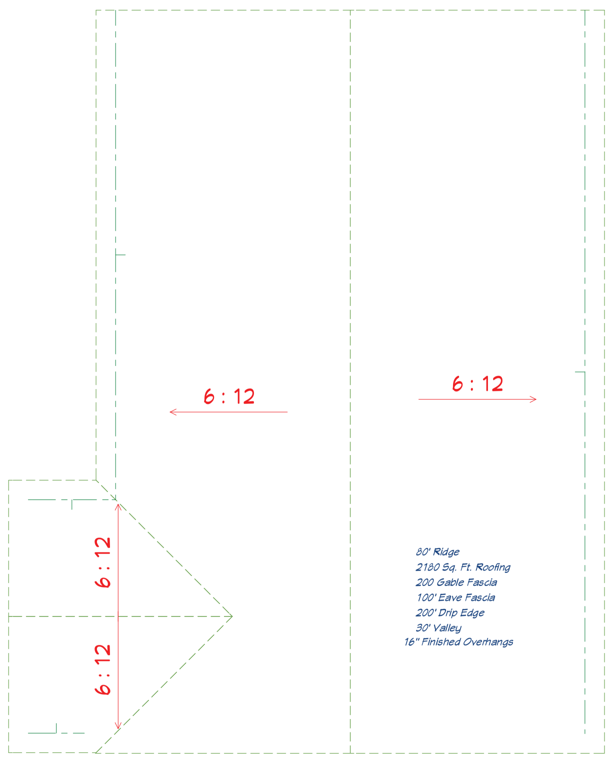
khwagler88@sle.email

DATE: 120102/ 23

SCALE:

SHEET:



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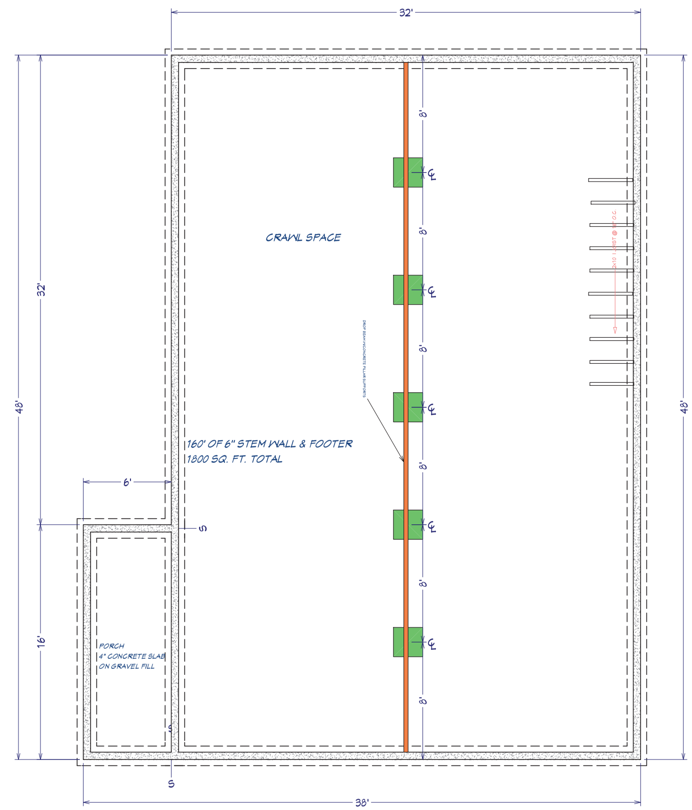

Foundation

New Plans For::::

Maple - C

DRAWINGS PROVIDED BY:
Ken Wagler
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DATE:
12010 2/ 23

SCALE:

SHEET:


955-ROLL

REPORT OF
GEOTECHNICAL ENGINEERING EXPLORATION

OOLITIC DRIVE RESIDENCES
BLOOMINGTON, INDIANA

PREPARED FOR:

RCH, LLC
1190 EAST 1400 NORTH
ODON, INDIANA 47562

Patriot Engineering and Environmental, Inc.
2006 South Yost Avenue
Bloomington, Indiana 47403

May 6, 2024

May 6, 2024

Mr. Melvin Graber
RCH, LLC
11990 East 1400 North
Odon, Indiana 47562

Re: **Report of Geotechnical Engineering Exploration**
Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

Dear Melvin:

Attached is the report of our geotechnical engineering exploration for the above referenced project. This exploration was completed in general accordance with our Proposal No. P24-0688-11G dated March 25, 2024.

This report includes detailed and graphic logs of six (6) soil borings drilled at the proposed project site. Also included in the report are the results of laboratory tests performed on samples obtained from the site, and geotechnical recommendations pertinent to the site development, foundation design, and construction.

We appreciate the opportunity to perform this geotechnical engineering exploration and are looking forward to working with you during the construction phase of the project. If you have any questions regarding this report or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Mark Jonard, E.I.
Geotechnical Engineer

WILLIAM D. DUBOIS REGISTERED 60018167 STATE OF INDIANA PROFESSIONAL ENGINEER

William D. Dubois, P.E.
Senior Principal Engineer

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APPENDICES

Appendix A: Site Vicinity Map (Figure No. 1)
Boring Location Map (Figure No. 2)
Boring Logs
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Unified Soil Classification System (USCS)

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Appendix C: General Qualifications
Standard Clause for Unanticipated Subsurface Conditions

REPORT OF GEOTECHNICAL ENGINEERING EXPLORATION

Oolitic Drive Residences
922 Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

1.0 INTRODUCTION

1.1 General

RCH, LLC is planning the construction of a three (3) small single-family homes to be located at the three (3) lots at 922 North Oolitic Drive in Bloomington, Indiana. The results of our geotechnical engineering exploration for the project are presented in this report.

1.2 Purpose and Scope

The purpose of this exploration is to determine the general near surface and subsurface conditions within the project area and to develop the geotechnical engineering recommendations necessary for the design and construction of the proposed structures. This was achieved by drilling soil borings, and by conducting laboratory tests on samples taken from the borings. This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and recommendations to aid in the design and construction of the proposed facility.

2.0 PROJECT INFORMATION

The proposed project is located along Oolitic Drive in Bloomington, Indiana. The project consists of three (3) single-family homes being built. These homes will be one (1)-story structures of slab-on-grade construction, approximately 32 feet by 48 feet of in plan dimension.

No structural loading information is available to us at the time of this report, but based on similar projects in the area, we can estimate that the proposed structures will have wall loads not exceeding 1,500 pounds per lineal feet (plf), isolated column loads not exceeding 60 kips, and that floor loads will not exceed 150 pounds per square foot (psf). Additionally, based on visual observations of the existing site, it is assumed that any grade raise fill to complete the construction of building pads, finished pavement subgrades, etc., will not exceed 2 feet above the existing ground surface.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The project site is presently an approximately 0.6 acres used for residential purposes. There were previously two (2) modular homes that were removed prior to our mobilization. The surrounding area is generally an area of residential development. The topography in the area proposed for construction is slopped down towards the center of the site, where a recorded sinkhole, per the Indiana Sinkhole Inventory provided by the Indiana Geological Survey, is present. Although the proposed buildings are not planned to be placed above the sinkhole, remediation is require for the project.

3.2 General Subsurface Conditions

Our interpretation of the subsurface conditions is based upon six (6) soil borings drilled at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". All depths discussed below refer to depths below the existing ground surface. Based on the results of the soil borings completed at the site, the following subsurface profile is presented. A description of each general soil unit has been identified and is described below:

Topsoil – Topsoil, a surficial layer of material that is a blend of silts, sands, and clays, with varying amounts of organic matter, was encountered at the ground surface at all of the six (6) boring locations. The topsoil layer was about 3 to 8 inches thick in the borings.

Silty Clay (CL) - The surficial layer is generally underlain by brown, slightly moist to very moist, soft to very stiff, silty clay. The silty clay layers extended to depths of 6 to 13.5 feet below the existing ground surface. The natural moisture content of this material ranges from 16 to 29 percent (%). The silty clay layers have unconfined compressive strengths, as determined by a hand penetrometer, of 1.9 to 4.5 tons per square foot (tsf). Standard Penetration Test N-values in this material varied from 4 to 23 blows per foot (bpf). Additionally, fill material, such as asphalt, gravel, brick and organics, was observed in multiples borings to varying depths (see the Table 1 below).

Clay (CH) - The silty clay layer is underlain by red, moist to very moist, medium stiff to hard, *High plasticity* clay. The clay layers extended to depths of 10 to 20 feet below the existing ground surface. The natural moisture content of this material ranges from 26 to 40 %. The silty clay layers have unconfined compressive strengths of 3.0 to 3.9 tsf. Standard Penetration Test N-values in this material varied from 13 to greater than 50 bpf.

Limestone – Below the clay layers at auger refusal, highly weather limestone was present.

The soil conditions described above are general, and some variations in the descriptions should be expected; for more specific information, please refer to the boring logs presented in Appendix "A". It should be noted that the dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. In-situ stratification changes could occur gradually or at different depths.

As previously mentioned, soft clays and unsuitable fill material were encountered in four (4) of the six (6) borings, at depths up to 13.5 feet below the existing ground surface. The following table presents the extent of the unsuitable soils encountered in the borings:

Table No. 1: Summary of Unsuitable Soils Encountered in Borings

Boring Number	Soil Classification	Approximate Depth of Unsuitable Soils (feet)[1]
B-3	Silty Clay (CL) with some asphalt and gravel (FILL)	3.5 to 6
B-4	Silty Clay (CL) with some asphalt (FILL)	0 to 3.5
	Asphalt and Gravel (FILL)	3.5 to 6
B-5	Soft Silty Clay (CL) with a trace of gravel and organics (FILL)	0 to 6
B-6	Silty Clay (CL) with a trace of asphalt (FILL)	0 to 6
	Silty Clay (CL) with some gravel and brick (FILL)	6 to 13.5

[1] Represents depth below existing ground surface.

3.3 Groundwater Conditions

The term groundwater pertains to any water that percolates through the soil found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water-bearing year round.

Groundwater was observed during drilling in one (1) of the soil borings (B-5) performed at the site at depths of 13 feet below the existing ground surface. Groundwater was not observed in the remaining borings during drilling. Immediately after the borings were completed and the augers were removed from the boreholes, groundwater was not observed.

It should be recognized that fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. ***The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this exploration.***

4.0 DESIGN RECOMMENDATIONS

4.1 Basis

Our recommendations are based on data presented in this report, which include soil borings, laboratory testing, and our experience with similar projects. Subsurface variations that may not be indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected.

4.2 Overall Site Evaluation

The borings indicate that the site is mostly underlain by clayey (CL) soils with fill materials observed in multiple borings. In general, the areas near soil borings performed may be suitable for the anticipated development following removal of the fill material. The soils will then be suitable for shallow foundations, and for support of floor slabs and pavements with these undercuts and soil replacement with compacted structural fill of the near surface soils. Additional Concerns for construction are listed below.

Expansive (Highly Plastic) Clays

Four (4) of the six (6) borings encountered highly plastic (expansive) clays (CH) at depths typically between about 6 and 20 feet below the existing ground surface. Expansive soils undergo volume changes upon wetting and drying. Expansive soils tend to shrink on drying and expand when the degree of saturation increases. However, the primary factors

that govern the amount of expansion of the soils are the availability of moisture and the amount and type of clay particles in the soil.

In Indiana, typically expansive soils within the upper 5 to 10 feet of the surface grade are influenced most by climatic environmental factors, which affect the water content of the soils and hence cause the soils to shrink and swell. This range of influence is generally referred to as the active zone. Foundations, floor slabs, pavements and subsurface utilities placed on or in this active zone of highly plastic (expansive) clays can be subjected to detrimental effects of shrink and swell; which can cause unsuitable total and/or differential settlements, along with cracking. Therefore, we recommend that foundations, floor slabs, pavements, other infrastructure not bear or be placed directly on highly plastic clays (CH). Positive drainage of surface water both during construction and after construction is complete will be especially important to reduce the amount of surface water that is allowed to permeate into the subgrade soils and subsequently reduce the potential for unsuitable shrinking or swelling of the underlying highly plastic clays. Water and drainage lines should be located such that if any leakage occurs, water will not be readily accessible to foundations, floor slabs and/or pavement sections. Additionally, the installation and use of an irrigation system at the parcel is highly discouraged.

Karst

The project site is located within a region known for karstic features. Karstic areas are typically associated with the development of solution features within the soluble carbonate bedrock leading to formation of sinkholes. A sinkhole is described as “Closed depression in soil or bedrock formed by the erosion and transport of earth material from below the land surface.” Sinkholes may develop within karstic areas as a result of soil fines migrating from the overburden soil by infiltrating water flowing downward into the bedrock through solution features/channels, such as voids and clay seams within the rock. Sinkholes may consist of a relatively localized weathered feature or larger features resulting from a collapse within a void formed in the overburden soils as a result of loss of the fine soils into the bedrock features. A sinkhole was observed on-site, as well as confirmed by the Indiana Sinkhole Inventory provided by the Indiana Geological Survey. Recommendations for remediation can be found in Section 5.2. If further evaluation of karst is desired, *Patriot* can provide geophysical testing services.

4.3 Foundations

As previously mentioned, unsuitable fill material was encountered in four (4) of the six (6) to depths up to 13.5 feet below existing grade and it is highly likely that potential existing fill

materials could be present within the project area due to previous construction activities. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the footing level or below, they must be undercut 3 feet below the bottom of the foundation and replaced with well-compacted structural fill prior to construction of foundations or the footings can be extended to suitable natural soils.*** Following the excavation of the footing areas, the foundations subgrade should be visually inspected by a *Patriot* representative and probed at multiple locations at isolated footings and at every 10 feet (maximum) along wall footings using a Dynamic Cone Penetrometer (DCP) to a minimum depth of 5 feet below the footing subgrade to verify that the underlying soil has a SPT blow count of 7 or more or unconfined compressive strength of 1.0 tsf or more. Any unsuitable soils encountered at the footing subgrade or below should be removed and replaced with well-compacted structural fill.

Provided the above recommendations are followed, the proposed structure can be supported on spread footings bearing on the medium stiff to very stiff silty clay encountered at shallow depths or on new well-compacted structural fill overlying the same. These footings should be proportioned using a net allowable soil bearing pressure not exceeding 2,000 pounds per square foot (psf) for column footings or 1,500 psf for wall (strip) footings. For proper performance at the recommended design bearing pressure, foundations must be constructed in compliance with the recommendations for footing excavation inspection that are discussed in Section 5.0 *"Construction Considerations"*.

In using the above net allowable soil bearing pressures, the weight of the foundation and backfill over the foundation need not be considered. Hence, only loads applied at or above the minimum finished grade adjacent to the footing need to be used for dimensioning the foundations. Each new foundation should be positioned so it does not induce significant pressure on adjacent foundations; otherwise the stress overlap must be considered in the design.

All exterior foundations and foundations in unheated areas should be located at a depth of at least 24 inches below final exterior grade for frost protection. We recommend that wall (strip) footings be at least 18 inches wide and column footings be at least 24 inches wide for bearing capacity considerations.

We estimate that the total foundation settlement should not exceed approximately 1 inch and that differential settlement should not exceed about ¾ inch. Careful field control during construction is necessary to minimize the actual settlement that will occur.

Positive drainage of surface water, including downspout discharge, should be maintained away from structure foundations to avoid wetting and weakening of the foundation soils both during construction and after construction is complete.

4.4 Floor Slabs

The near surface or shallow subgrade soils encountered within the proposed building footprint generally consist of medium stiff to stiff silty clay and fill material. While the silty clay material is suitable for floor slab support, the fill material is not. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the floor slab subgrade, they must be undercut and replaced with well-compacted structural fill prior to construction of floor slabs.***

We recommend that all floor slabs be designed as "floating", that is, fully ground supported and not structurally connected to walls or foundations. This is to minimize the possibility of cracking and displacement of the floor slabs because of differential movements between the slab and the foundation. Although the movements are estimated to be within the tolerable limits for the structural safety, such movements could be detrimental to the slabs if they were rigidly connected to the foundations. Additionally, we recommend that all slabs should be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions.

The building floor slabs should be supported on a minimum 6 inch thick well-compacted granular base course (i.e. Indiana Department of Transportation (INDOT) No. 53 crushed stone) bearing on a suitably prepared subgrade (Refer to Section 5.0 *"Construction Considerations"*). The granular base course is expected to help distribute loads and equalize moisture conditions beneath the slab.

Provided that the recommendations above for floor slab design and construction are followed, a modulus of subgrade reaction, "K_{30}" value of 75 pounds per cubic inch (pci), is recommended for the design of ground supported floor slabs. It should be noted that the "K_{30}" modulus is based on a 30 inch diameter plate load empirical relationship.

4.5 Seismic Considerations

For structural design purposes, we recommend using a ***Site Classification of "C"*** as defined by the Indiana Building Code (modified 2012 International Building Code (IBC)). Furthermore, along with using a Site Classification of "C", we recommend the use of the

maximum considered spectral response acceleration and design spectral response acceleration coefficients provided in Table No. 2 below. Refer to Appendix "B" for *"Seismic Site Class Evaluation"* report summary.

Table No. 2: Seismic Design Spectral Response Acceleration Coefficients

Period (seconds)	Maximum Considered Spectral Response Acceleration Coefficient	Soil Factor	Design Spectral Response Acceleration Coefficient
0.2	S_S = 0.225 g	1.20	S_{DS} = 0.180 g
1.0	S_1 = 0.107 g	1.69	S_{D1} = 0.121 g

These values were obtained from the *"Earthquake Ground Motion Parameters"* program for seismic design, developed by the United States Geological Survey (USGS) Earthquake Hazard Program, utilizing latitude 39.175149° north and longitude 86.5534332° west as the designation for identifying the location of the parcel. Other earthquake resistant design parameters should be applied consistent with the minimum requirements of the Indiana Building Code.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

All areas that will support foundations, floors, pavements or newly placed structural fill must be properly prepared. All loose surficial soil or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include: frozen soil, relatively soft material, relatively wet soils, deleterious material, or soils that exhibit a high organic content.

Approximately 3 to 8 inches of loose surficial topsoil was encountered in the borings. The topsoil was measured at discrete locations as shown on the Boring Location Map (Figure No. 2) in Appendix "A". The topsoil thickness measured at the boring locations may or may not be representative of the overall average topsoil thickness at the site. Therefore, it is possible that the actual stripping depth could significantly vary from this data. The data presented should be viewed only as a guide to the minimum stripping depth that will be

required to remove organic material at the surface. Additional field exploration by *Patriot* would be required to provide an accurate estimate of the stripping depth. This limited data indicates that a minimum stripping depth will be required to remove the organic material at the surface, followed by the potential for additional stripping and/or scarification and recompaction as may be required to achieve suitable subgrade support. ***Additionally, if saturated conditions exist with the surface soils, light tracked equipment could be required to avoid pushing organics deeper into the suitable subgrade soils.*** A *Patriot* representative should verify the stripping depth at the time grading operations occur.

Prior to construction of floor slabs, pavements or the placement of new structural fill, the exposed subgrade must be evaluated by a Patriot representative; which will include proofrolling of the subgrade. Proofrolling should consist of repeated passes of a loaded, pneumatic-tired vehicle such as a tandem-axle dump-truck or scraper. The proofrolling operations should be observed by a *Patriot* representative, and the proofrolling vehicle should be loaded as directed by *Patriot*. Any area found to rut, pump, or deflect excessively should be compacted in-place or, if necessary, undercut and replaced with structural fill, compacted as specified in Section 5.3 *"Structural Fill and Fill Placement Control"*.

Care must be exercised during grading and fill placement operations. ***The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction.*** The contractor must exercise discretion when selecting equipment sizes and also make a concerted effort to control construction traffic and surface water while the subgrade soils are exposed. We recommend that heavy construction equipment (i.e. dump trucks, scrapers, etc.) be rerouted away from the building and pavement areas. If such problems do arise, the operations in the affected area should be halted and the *Patriot* representative contacted to evaluate the condition.

5.2 Sinkhole Remediation

The actual method used for the treatment of sinkholes is typically dependent on the depth to bedrock and the intended purpose of the area subjected to remediation. Several acceptable methods of treatment are discussed below.

If the depth to the top of bedrock is greater than 15 feet the following should be performed:

- Remove all debris from the hole

- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density

Please refer to Illustration A at the end of this report.

If the depth to the top of bedrock is less than 15 feet the following should be performed:

- Remove all debris from the hole
- Excavate to the top of the bedrock
- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place 1 foot of compacted crushed limestone (DGA), compacted to 100% of standard proctor maximum dry density
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density
- Or instead of crushed limestone and soil cap, place 1-foot reinforced concrete cap

Please refer to Illustrations B and C at the end of this report.

5.3 Foundation Excavations

Upon completion of the foundation excavations and prior to the placement of reinforcing steel, a *Patriot* representative should check the exposed subgrade to confirm that a bearing surface of adequate strength has been reached. Any localized soft soil zones encountered at the bearing elevations should be further excavated until adequate support soils are encountered. The cavity should be backfilled with structural fill as defined below, or the footing can be poured at the excavated depth. Structural fill used as backfill beneath footings should be limited to lean concrete, well-graded sand and gravel, or crushed stone placed and compacted in accordance with Section 5.3 *"Structural Fill and Fill Placement Control"*.

If it is necessary to support spread footings on structural fill, the fill pad must extend laterally a minimum distance beyond the edge of the footing. The minimum structural pad

width would correspond with a point at which an imaginary line extending downward from the outside edge of the footing at a 1H:2V (horizontal: vertical) slope intersects the surface of the natural soils. For example, if the depth to the bottom of excavation is 4 feet below the bottom of the foundation, the excavation would need to extend laterally beyond the edge of the footing at least 2 feet, as shown in Illustration "A" found at the conclusion of this report.

Excavation slopes should be maintained within all requirements set-forth by the Occupational Safety and Health Standards (OSHA), but specifically Section 1926 Subpart "P" – *"Excavations"*. We recommend that any surcharge fill or heavy equipment be kept at least 5 feet away from the edge of the excavation.

Construction traffic on the exposed surface of the bearing soil will potentially cause some disturbance of the subgrade and consequently loss of bearing capacity. However, the degree of disturbance can be minimized by proper protection of the exposed surface.

5.4 Structural Fill and Fill Placement Control

Structural fill, defined as any fill which will support structural loads, should be clean and free of organic material, debris, deleterious materials and frozen soils. Samples of the proposed fill materials should be tested prior to initiating the earthwork and backfilling operations to determine the classification, the natural and optimum moisture contents and maximum dry density and overall suitability as a structural fill. ***Structural fill should have a liquid limit less than 40 and a plasticity index less than 20.***

All structural fill beneath floor slabs, adjacent to foundations and over foundations, should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698). This minimum compaction requirement should be increased to 100 percent (%) of the maximum Standard Proctor dry density for fill supporting footings, provided these are designed as outlined Section 4.0 *"Design Recommendations"*.

Structural fill supporting, around and over utilities should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698) for utilities underlying structural areas (i.e. buildings, pavements, sidewalks, etc.). However, the minimum compaction requirement can be reduced for backfill around and over the utilities to 90 percent (%) of the maximum Standard Proctor dry density where utilities underlie greenbelt areas (i.e. grassy lawns, landscaping, etc.). It is recommended that a

clean well-grade granular material be utilized as the bedding material, as well as the backfill material around and over the utility lines.

In cut areas, where pavement sections are planned, the upper 10 inches of subgrade should be scarified and compacted to a dry density of at least 100 percent (%) of the Standard Proctor maximum dry density (ASTM D-698). Any grade-raise fill placed within 1 foot of the base of the pavement section should also be compacted to at least 100 percent (%) of the Standard Proctor maximum dry density. This can be reduced to 95 percent (%) for structural fill placed more than 1 foot below the base of the pavement section.

To achieve the recommended compaction of the structural fill, we suggest that the fill be placed and compacted in layers not exceeding 8 inches in loose thickness (the loose lift thickness should be reduced to 6 inches when utilizing small hand compactors) and within the range of 2 percentage (%) points below or above the optimum moisture content value. All fill placement should be monitored by a *Patriot* representative. ***Each lift should be tested for proper compaction at a frequency of at least one (1) test every 2,500 square feet (ft^2) per lift for the building areas, at least one (1) test every 10,000 square feet (ft^2) per lift for the parking and roadway areas, and at a frequency of at least one (1) test for every 50 lineal feet of utility installation.***

5.5 Groundwater Considerations

Groundwater was observed during our field activities at depths between 13 feet below the existing ground surface (Refer to Section 3.3 *"Groundwater Conditions"*); which is expected to be below the anticipated foundation excavation depths. Depending on seasonal conditions, localized and sporadic groundwater infiltration may occur into the building foundation excavations on this site.

Groundwater inflow into shallow excavations **above** the groundwater table is expected to be adequately controlled by conventional methods such as gravity drainage and/or pumping from sumps. More significant inflow can be expected in deeper excavations **below** the groundwater table requiring more aggressive dewatering techniques, such as well or wellpoint systems. For groundwater to have minimal effects on the construction, foundation excavations should be constructed and poured in the same day, if possible.

6.0 EXPLORATIONAL PROCEDURES

6.1 Field Work

A total of six (6) soil borings were drilled, sampled, and tested at the project site on April 17, 2024 at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". The soil borings were drilled to depths of 20 feet in the proposed building area. All depths are given as feet below the existing ground surface.

The borings were advanced using 3¼ inch inside diameter hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2 inch outside diameter by $1^{3}/_{8}$ inch inside diameter split-spoon sampler was driven a total of 18 inches with the number of blows of a 140 pound hammer falling 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5 feet intervals, beginning at a depth of 1 foot below the existing surface grade, extending to a depth of 10 feet, and at 5 feet intervals thereafter to the termination of the boring.

Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings prior to demobilization for safety considerations.

Upon completion of the boring program, all of the samples retrieved during drilling were returned to *Patriot*'s soil testing laboratory where they were visually examined and classified. A laboratory-generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual examination. Test boring logs and a description of the classification system are included in Appendix "A" in this report. Indicated on each log are: the primary strata encountered, the depth of each stratum change, the depth of each sample, the Standard Penetration Test results, groundwater conditions, and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

6.2 Laboratory Testing

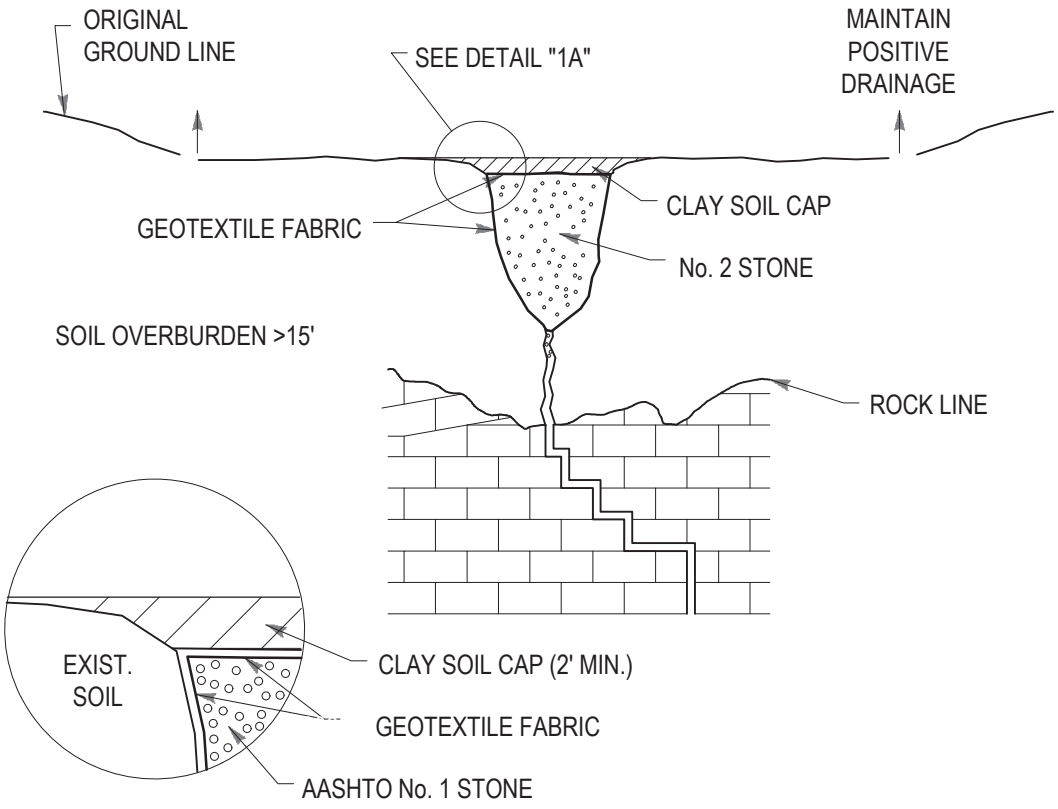
Representative samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. Laboratory analysis included: natural moisture content determinations (ASTM D 2216) and an

estimate of the unconfined compressive strength (q_u) of the cohesive soil samples utilizing a calibrated hand penetrometer (q_p) were obtained. The results of laboratory tests are summarized in Section 3.2 *"General Subsurface Conditions"*. Soil descriptions on the boring logs are in accordance with the Unified Soil Classification System (USCS).

7.0 ILLUSTRATIONS

See Illustrations "D" and "E" on the following pages. These illustrations are presented for reference for the remediation and backfill of sinkholes presented in Section 5.2.

See Illustrations "D" and "E" on the following pages. These illustrations are presented to further visually clarify several of the construction considerations presented in Section 5.3 *"Foundation Excavations"*.



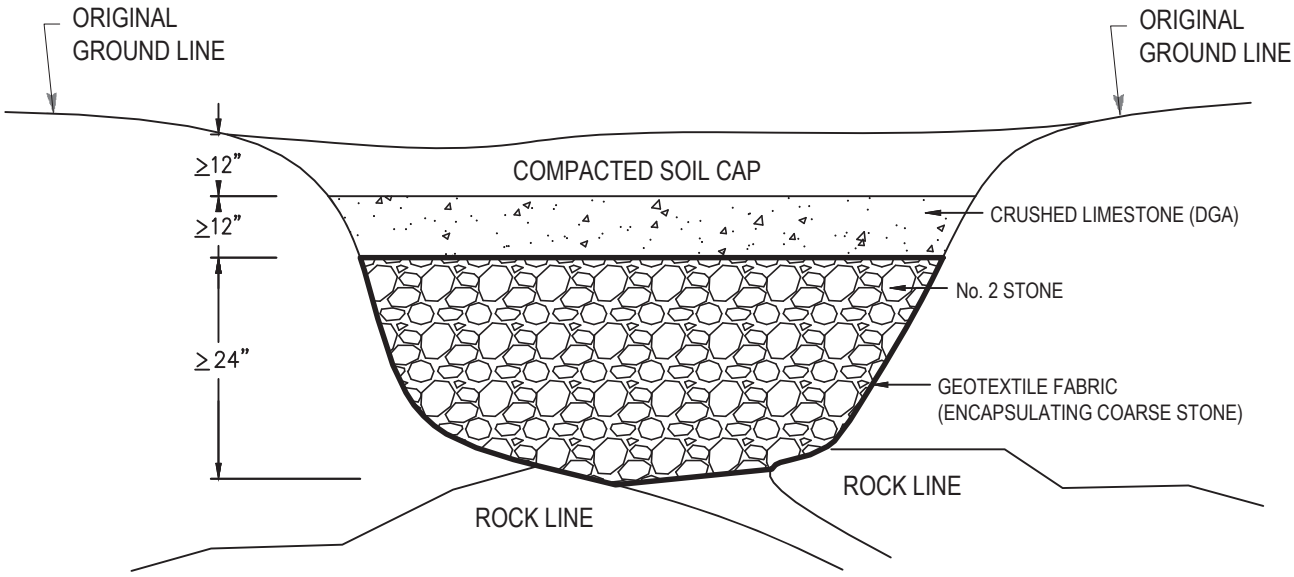
DETAIL "1A"

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration A

Treatment Method for
Deep Sink Holes



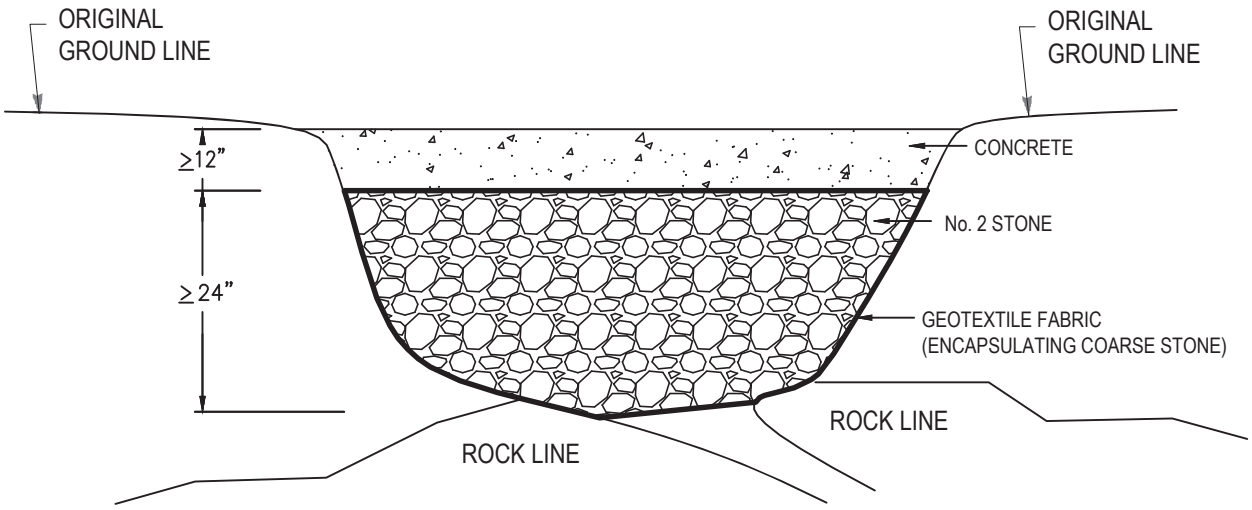
SOIL OVERBURDEN <15'

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration B

Treatment Method for Sink Holes



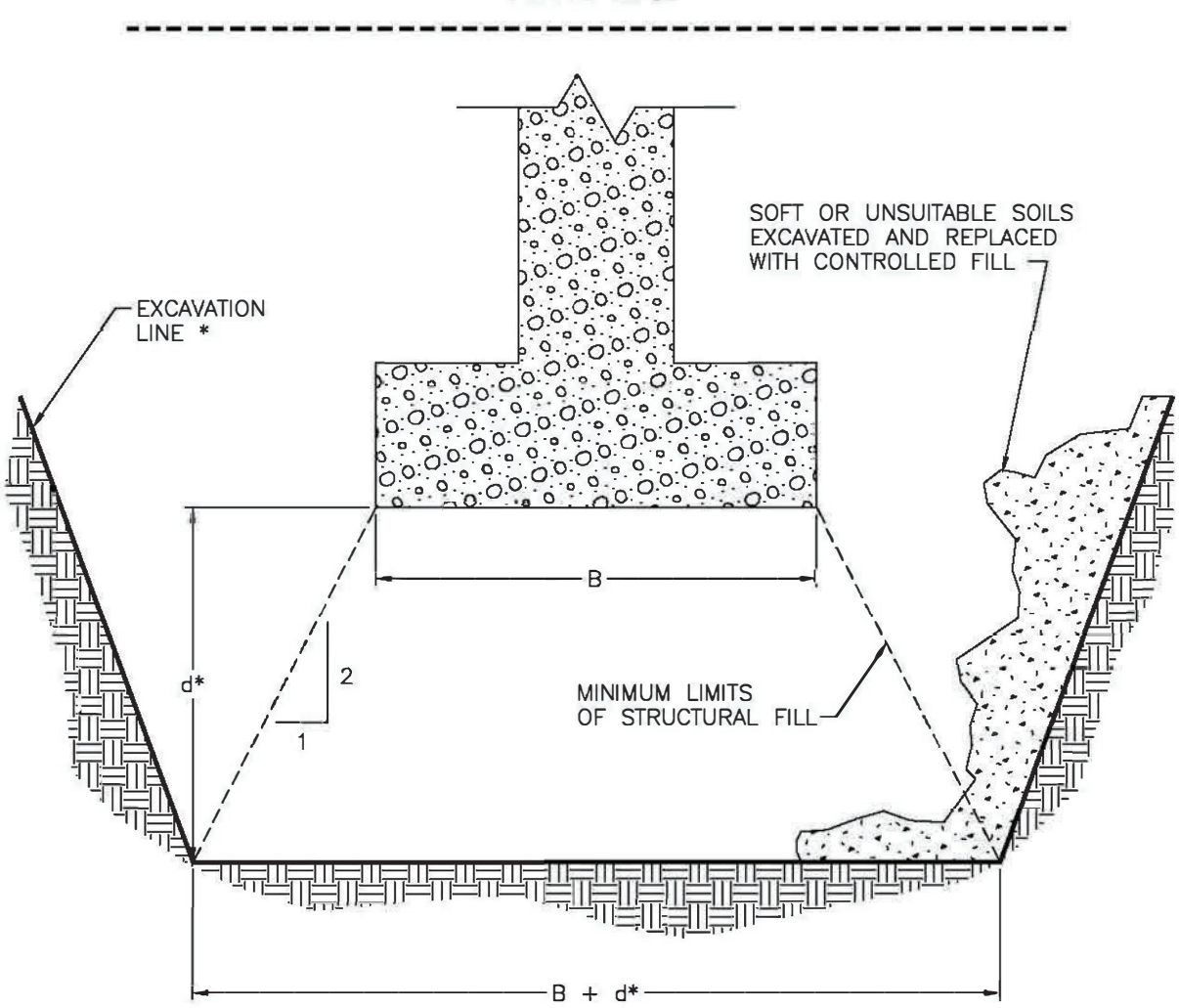
SOIL OVERBURDEN <15'

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

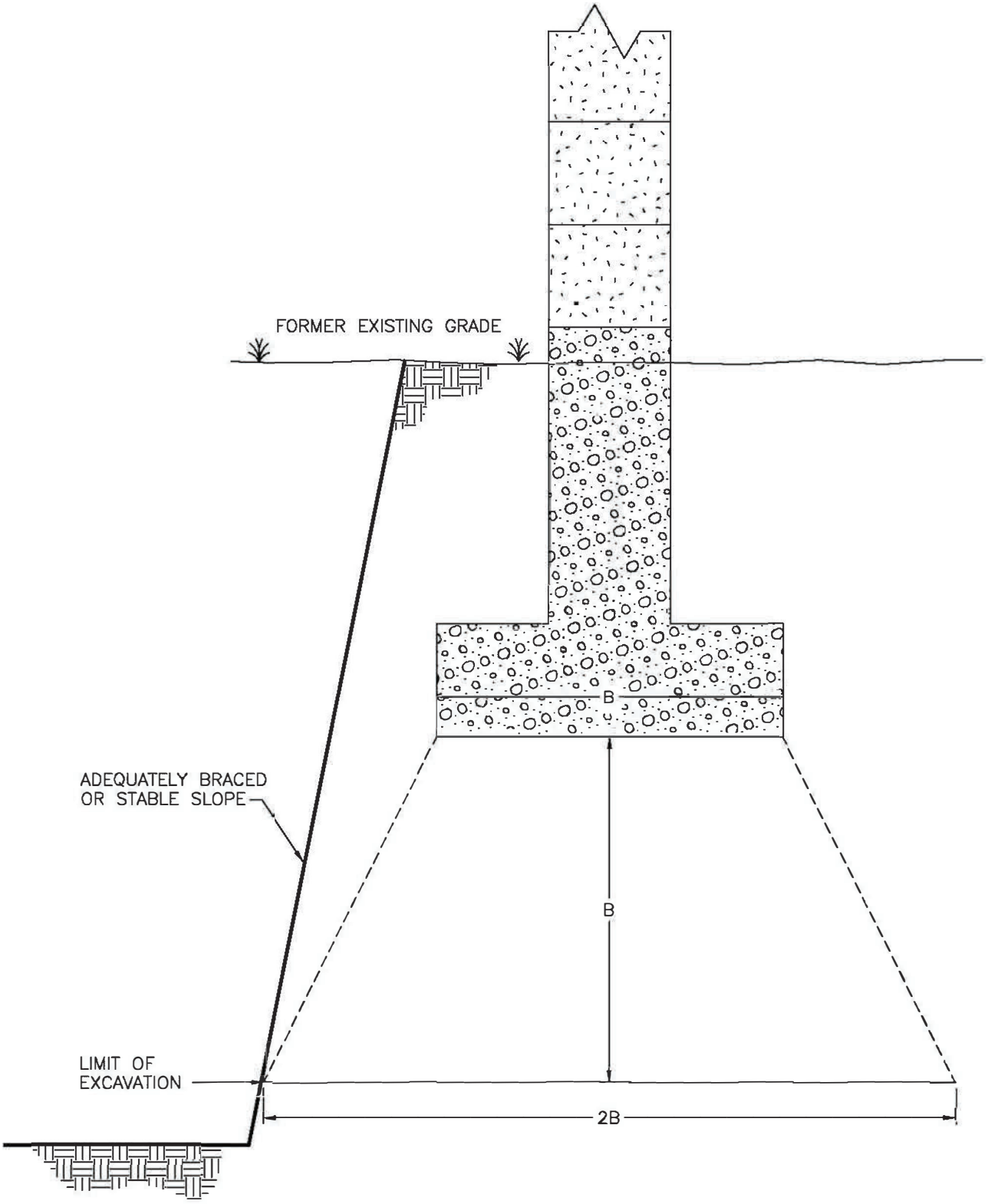
Illustration C

Treatment Method for Sink Holes



*d IS DEPTH TO SUITABLE SOILS

* IN COMPLIANCE WITH OSHA STANDARDS



PATRIOT ENGINEERING
and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical
and Materials Engineers

Excavation Near Existing
In Use Foundations
ILLUSTRATION E

job. no.:

figure:

APPENDIX A

SITE VICINITY MAP (FIGURE NO. 1)

BORING LOCATION MAP (FIGURE NO. 2)

BORING LOGS

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 1

Site Vicinity Map

Patriot Engineering & Environmental, Inc.

NOTES:
1. Boring locations were staked by PATRIOT. All locations are shown as approximate.
2. All locations were determined in the field with references to existing landmarks.
3. Image Source: Google Earth
4. Scale as shown.

Project: Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number: 24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 2

Soil Boring Location Map

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Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-1

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 881 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.20"N
Drilling Method	: HSA	Longitude	: 86°33'11.58"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 881	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
					Red, moist to very moist, stiff to hard, SILTY CLAY	1	100	4/4/7	2.3	24	
						2	67	4/6/7	1.9	23	
5	875		CL			3	33	6/10/13	2.7	24	
						4	94	6/7/8	4.5	22	Boring caved to 8.5 feet upon auger removal.
10	870										
					Gray, highly weathered, LIMESTONE	5	17	50-3"			Auger refusal encountered at 13.5 feet.
15	865				Splitspoon refusal encountered at 13.8 feet.						Groundwater was not encountered during drilling, nor upon completion.
20	860										
25											
	855										

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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-2

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 883 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.44"N
Drilling Method	: HSA	Longitude	: 86°33'11.73"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 883	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	880		CL		Brown, very moist, stiff, SILTY CLAY with trace gravel	1	100	4/5/7		26	
5			CL		Red, very moist, stiff to very stiff, SILTY CLAY	2	89	4/7/8	2.5	26	Boring caved to 5 feet upon auger removal.
	875		CH		Red, very moist, stiff to very stiff, CLAY	3	100	4/6/8	3.0	37	
10						4	50	4/18/50-4"		28	
					Gray, highly weathered LIMESTONE						
	870				Auger refusal encountered at 12 feet						Groundwater was not encountered during drilling, nor upon completion.
15											
	865										
20											
	860										
25											

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PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-3

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.98"N
Drilling Method	: HSA	Longitude	: 86°33'11.69"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
	875		CL		Red, moist, medium stiff, SILTY CLAY	1	17	9/5/3		21	Boring caved to 2 feet upon auger removal.
5			CL		Red, moist, medium stiff, SILTY CLAY with some gravel and asphalt (FILL)	2	44	1/3/3		21	
	870		CH		Red, very moist, hard, CLAY with trace limestone	3	33	4/50-4"		40	
10					Gray, highly weathered, LIMESTONE	4	44	50-4"			
	865				Auger refusal encountered at 12 feet.						Groundwater was not encountered during drilling, nor upon completion.
15											
	860										
20											
	855										
25											

05-02-2024 C:\Users\mjonard\Patriot Engineering\GEO - Documents\Mtech\2024 Mtech\0455-11G\b3.bor

PATRIOT ENGINEERING and Environmental Inc.
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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-4

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 877 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.60"N
Drilling Method	: HSA	Longitude	: 86°33'11.65"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 877	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (3")						
	875		CL		Brown, slightly moist, stiff, SILTY CLAY with some asphalt (FILL)	1	44	4/4/6		16	
					ASPHALT and GRAVEL (FILL)	2	72	11/13/6		6	
5					Red, very moist, stiff to very stiff, CLAY	3	50	4/6/7	3.9	28	Boring caved to 6 feet upon auger removal.
	870					4	72	8/11/9	3.6	31	
10											
	865		CH								
15						5	100	7/13/10		27	
	860										
20						6	72	7/10/12		26	
	855				Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
25											

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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-5

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.17"N
Drilling Method	: HSA	Longitude	: 86°33'12.62"W

Water Levels
- During Drilling - 13.0 feet
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (5")						
					Brown, moist to very moist, soft to medium stiff, SILTY CLAY with trace gravel and organics (FILL)	1	33	1/1/24		21	
	875		CL			2	56	2/2/2		19	
5											Boring caved to 5 feet upon auger removal.
					Brown to Gray, moist to very moist, medium stiff to stiff, SILTY CLAY	3	33	4/4/4		24	
	870					4	39	3/3/4		21	
10											
	865	▼	CL			5	100	1/3/3		29	
15											
	860										
20						6	100	4/6/6		21	
	855				Boring terminated at 20 feet.						
25											

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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-6

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.23"N
Drilling Method	: HSA	Longitude	: 86°33'11.77"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	USCS	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0			TOPSOIL (5")						
		CL	Brown, moist, stiff, SILTY CLAY with trace asphalt (FILL)	1	94	4/5/5		21	
	875			2	56	4/5/5			
5		CL	Brown, moist, medium stiff, SILTY CLAY with trace asphalt (FILL)	3	33	4/4/3		19	
	870								Boring caved to 8 feet upon auger removal.
10		CL	Brown, moist, medium stiff, SILTY CLAY with some gravel and brick (FILL)	4	17	1/3/2			
	865								
15		CH	Red, very moist, stiff to hard, CLAY	5	67	9/11/12	3.3	32	
	860								
20				6	100	4/9/12	3.0	37	
	855		Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
25									

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON-COHESIVE SOILS
(Silt, Sand, Gravel, and Combinations)

Density	Field Identification (SPT Blows/ft)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 51

Grain Size Terminology

Soil Fraction	Particle Size	US Standard Sieve Size
Boulders	> 12 inches	> 12 inches
Cobbles	3 - 12 inches	3 - 12 inches
Gravel: Coarse	¾ - 3 inches	¾ - 3 inches
Small	4.76 mm - ¾ inch	No. 4 - ¾ inches
Sand: Coarse	2.00 - 4.76 mm	No. 10 - No. 4
Medium	0.42 - 2.00 mm	No. 40 - No. 10
Fine	0.074 - 0.42 mm	No. 200 – No. 40
Silt	0.005 - 0.074 mm	< No. 200
Clay	< 0.005 mm	< No. 200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/ft^2)	Field Identification (SPT Blows/ft)
Very Soft	Less than 0.25	0 - 2
Soft	0.25 – < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 -15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification: Provided on Boring Logs are made by visual inspection.

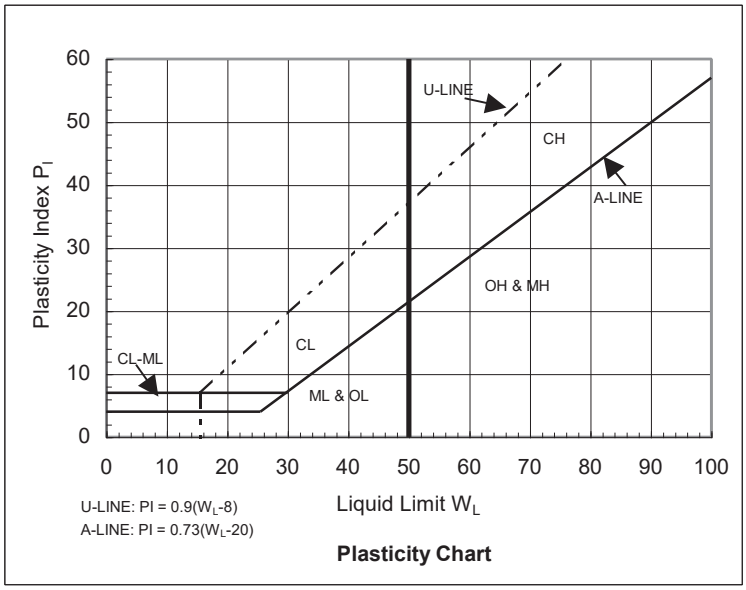
Standard Penetration Test: Driving a 2 inch outer-diameter (O.D.) by 1⅜ inch inner-diameter (I.D.) split-spoon sampler a total of 18 inches into undisturbed soil with the number of blows of a 140 pound hammer free-falling a distance of 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the "N"-value (or blow-count).

Strata Changes: In the column "Descriptions" on the Boring Logs the horizontal lines represent strata changes. A solid line (———) represents an observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater: Observations were made at the times indicated on the Boring Logs. Fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. *Groundwater symbols*: (▼)-observed groundwater level and/or elevation during drilling; (∇)-observed groundwater level and/or elevation upon completion of boring.

Unified Soil Classification System (USCS)

Major Divisions			Group Symbol		Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM	d u l	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols	
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_c > 3$)		
		Sands with fines (appreciable amount of fines)	SM	d u l	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols	
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (liquid limit >50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays or high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT		Peat and other highly organic soils			



Plasticity Chart

APPENDIX B

SEISMIC SITE CLASS EVALUATION

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

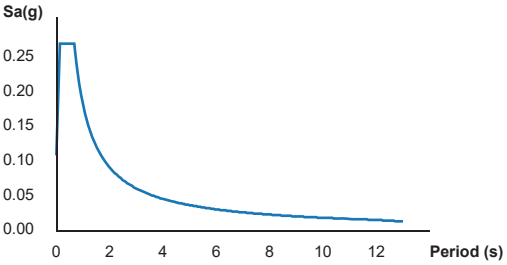
The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

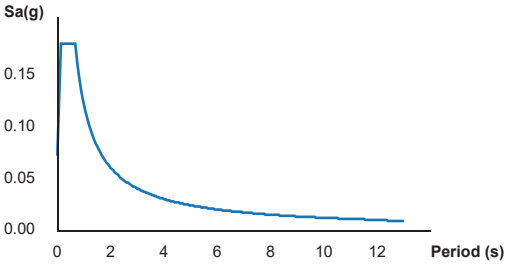
Search Information

Address:	922 N Oolitic Dr, Bloomington, IN 47404, USA
Coordinates:	39.175149, -86.5534332
Elevation:	879 ft
Timestamp:	2024-05-03T13:50:55.486Z
Hazard Type:	Seismic
Reference Document:	IBC-2012
Risk Category:	II
Site Class:	C

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.225	MCE_R ground motion (period=0.2s)
S_1	0.107	MCE_R ground motion (period=1.0s)
S_{MS}	0.269	Site-modified spectral acceleration value
S_{M1}	0.181	Site-modified spectral acceleration value
S_{DS}	0.18	Numeric seismic design value at 0.2s SA
S_{D1}	0.121	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	1.693	Site amplification factor at 1.0s
CR_S	0.9	Coefficient of risk (0.2s)
CR_1	0.854	Coefficient of risk (1.0s)
PGA	0.107	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.128	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	0.225	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.25	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.107	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.125	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)

PGAd	0.6	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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APPENDIX C

GENERAL QUALIFICATIONS

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

GENERAL QUALIFICATIONS

of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

This report may not contain sufficient information for purposes of other parties or other uses. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report. Should there be any significant differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The recommendations provided herein were developed from the information obtained in the test borings, which depict subsurface conditions only at specific locations. The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. The nature and extent of variations between borings may not become evident until the time of construction. If, after performing on-site observations during construction and noting the characteristics of any variation, substantially different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that Patriot be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

BLOOMINGTON BOARD OF ZONING APPEALS **CASE #: V-14-24/ VAR-2024-04-0031**
STAFF REPORT **DATE: May 23, 2024**

Location: 922 N Oolitic Dr (parcel # 53-05-32-201-077.059-005) (Lot 59 of Forest Homes)

PETITIONER: Ruby Creek Homes
11990 E 1400 N, Oden, IN 47562

CONSULTANTS: Melvin Graber
11990 E 1400 N, Oden, IN 47562

REQUEST: Variance from Karst Preservation standards to allow disturbance within 25' of the last closed contour of a karst feature for a property in the Residential Medium Lot (R2) zoning district.

REPORT: This 0.19-acre property is located at 922 N Oolitic Dr. The property is zoned Residential Medium Lot (R2). Surrounding zones are all Residential Medium Lot (R2) and surrounding land uses are all Dwelling, Single Family (detached).

Previous to the current owner, this lot of record, along with the Forest Homes Lots 57 and 58 (914 and 918 N Oolitic), were owned by the same owner and two mobile homes sat on all three lots for many years.

There is a karst feature, a sinkhole, located on this property. Existing elevations on this site range from 876 feet to 882 feet. There is currently no stormwater infrastructure at or near this site.

Chapter 4 of the Unified Development Ordinance (UDO), Title 20 of the Bloomington Municipal Code) states that no land-disturbing activity, mowing, or temporary or permanent structure shall be allowed within the sinkhole nor within 25 feet of the last closed contour of the sinkhole. Title 20 of the UDO defines the sinkhole as the last closed contour line of the feature on the City's geographic information system. Historic contour mapping shows that this entire property located at 922 N Oolitic falls within the last closed contours and 25 foot buffer of the karst feature, which is at an elevation of 882 feet, which means that according to the UDO, the entire lot cannot be disturbed. Since this entire site lies within the area shown to be within the last closed contour of the karst feature, a variance must be granted to allow any disturbance on this property.

The petitioner is requesting a variance from the karst preservation standards to allow disturbance within 25' of the last closed contour of the karst feature.

As part of this variance request, a report of geotechnical engineering exploration was submitted. The report confirmed that a sinkhole is present on the site and it provided information about soil composition in two locations on this property through analysis of soil borings. The report also provided sinkhole remediation methods of treatment and construction recommendations for placing a single family structure on the site.

CRITERIA AND FINDINGS FOR DEVELOPMENT STANDARDS VARIANCE
20.06.080(b)(3)(E) Standards for Granting Variances from Development Standards:

A variance from the development standards of the Unified Development Ordinance may be approved only upon determination in writing that each of the following criteria is met:

1) *The approval will not be injurious to the public health, safety, morals, and general welfare of the community.*

   PROPOSED FINDING: The granting of the variance will not be injurious to the public health, safety, morals, or general welfare of the community. A number of structures have existed in and around this karst feature for many years with no collapse. Proper testing of and restoration of the site will be required before building construction is allowed in order to maximize water infiltration on the site and ensure that water is not diverted off site, and to make sure that the site is safe for construction.

2) *The use and value of the area adjacent to the property included in the Development Standards Variance will not be affected in a substantially adverse manner.*

   PROPOSED FINDING: No adverse impacts to the use and value of surrounding properties as a result of the requested variance are found. At least half of this property is located four to eight feet in elevation higher than the apparent lowest point of the sinkhole. Current site elevation conditions show that the portions of the karst feature that are most sensitive are found on the adjacent property to the south of this property. With the remediation of the sinkhole, drainage analysis and the installation of drainage solutions, impact to surrounding properties should be mitigated.

3) *The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the Development Standards Variance will relieve the practical difficulties.*

   PROPOSED FINDING: The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property because it renders the entire site unbuildable. There has been development within the last closed contours of this feature for a number of years without any indications of negative impact. The practical difficulties are peculiar to the property in question because it is uncommon for an entire property to be located within a UDO-defined sinkhole, but because the properties in this area are smaller and closer together, the extent of the last closed contour of the sinkhole renders the entire site unbuildable.

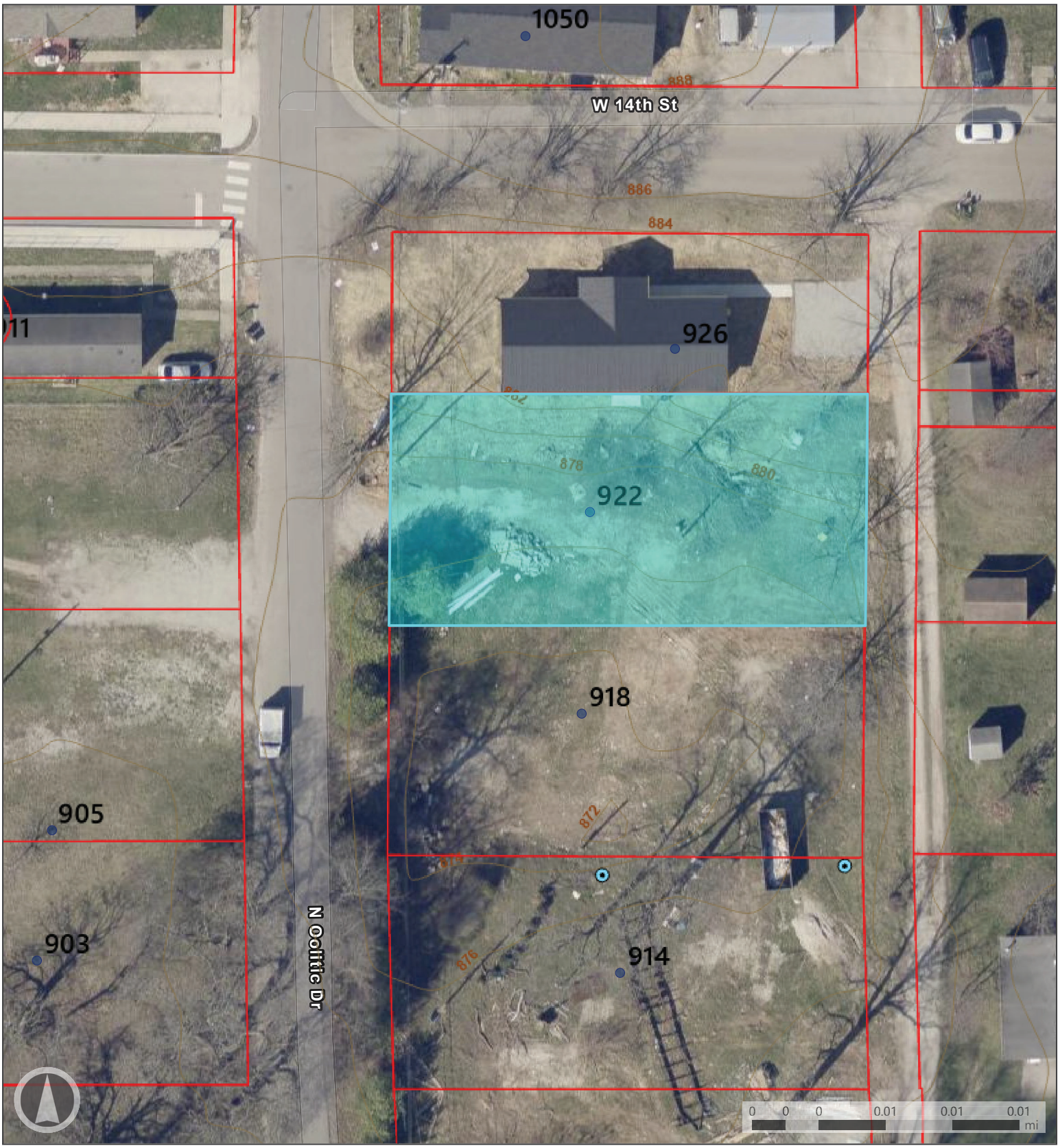
RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopt the proposed findings and approve **V-14-24/ VAR-2024-04-0031, with the following conditions:**

1. Because the area around the last closed contour of the sinkhole has created obvious steep slopes on the site, construction of the home should occur south of the 878 contour line.
2. Implementation of sinkhole remediation as outlined in the attached geotechnical report, is required – at all three properties (914, 918 and 922 N Oolitic) - before a Certificate of Zoning Compliance will be issued.
3. Submission of a drainage and water flow analysis post-sinkhole remediation is required before a Certificate of Zoning Compliance will be issued. The report must be approved by City of Bloomington Planning & Transportation and Utility Departments.
4. Implementation of design and construction recommendations provided in the attached geotechnical report is required before a Certificate of Zoning Compliance will be issued.
5. Testing of soil and water contamination testing and provision of any necessary remediation identified related to those tests is required before a Certificate of Zoning Compliance will be issued.
6. A Zoning Commitment shall be recorded indicating the presence of the karst feature and describing the Karst Conservancy Easement before a Certificate of Zoning Compliance will be issued.

City of Bloomington

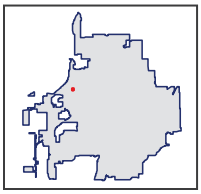
Context Aerial

V-14-24/ VAR-2024-04-0031



Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary

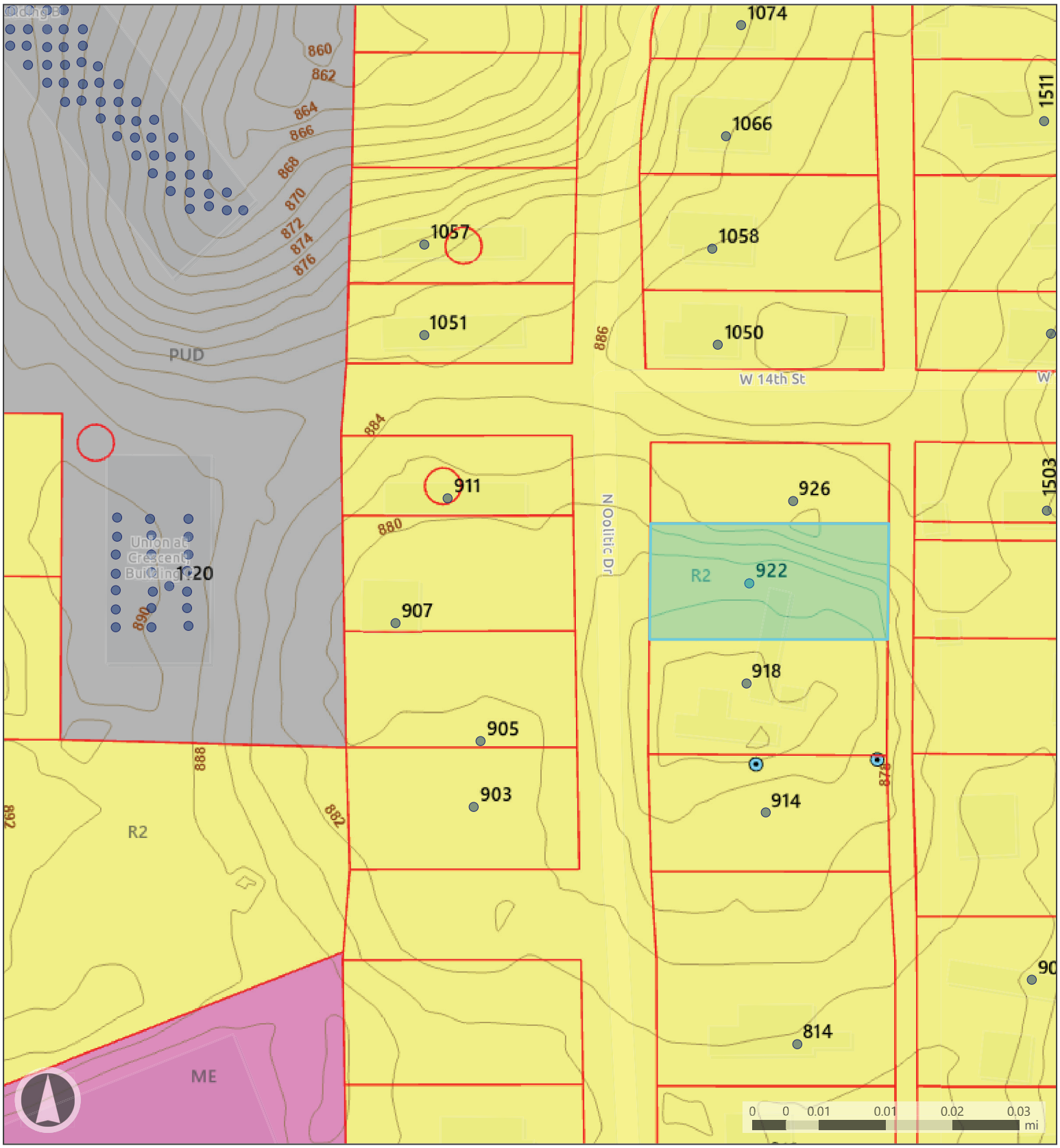


Created: 5/17/2024 *Map By: Katie Gandhi*

City of Bloomington

Location Map

V-14-24/ VAR-2024-04-0031

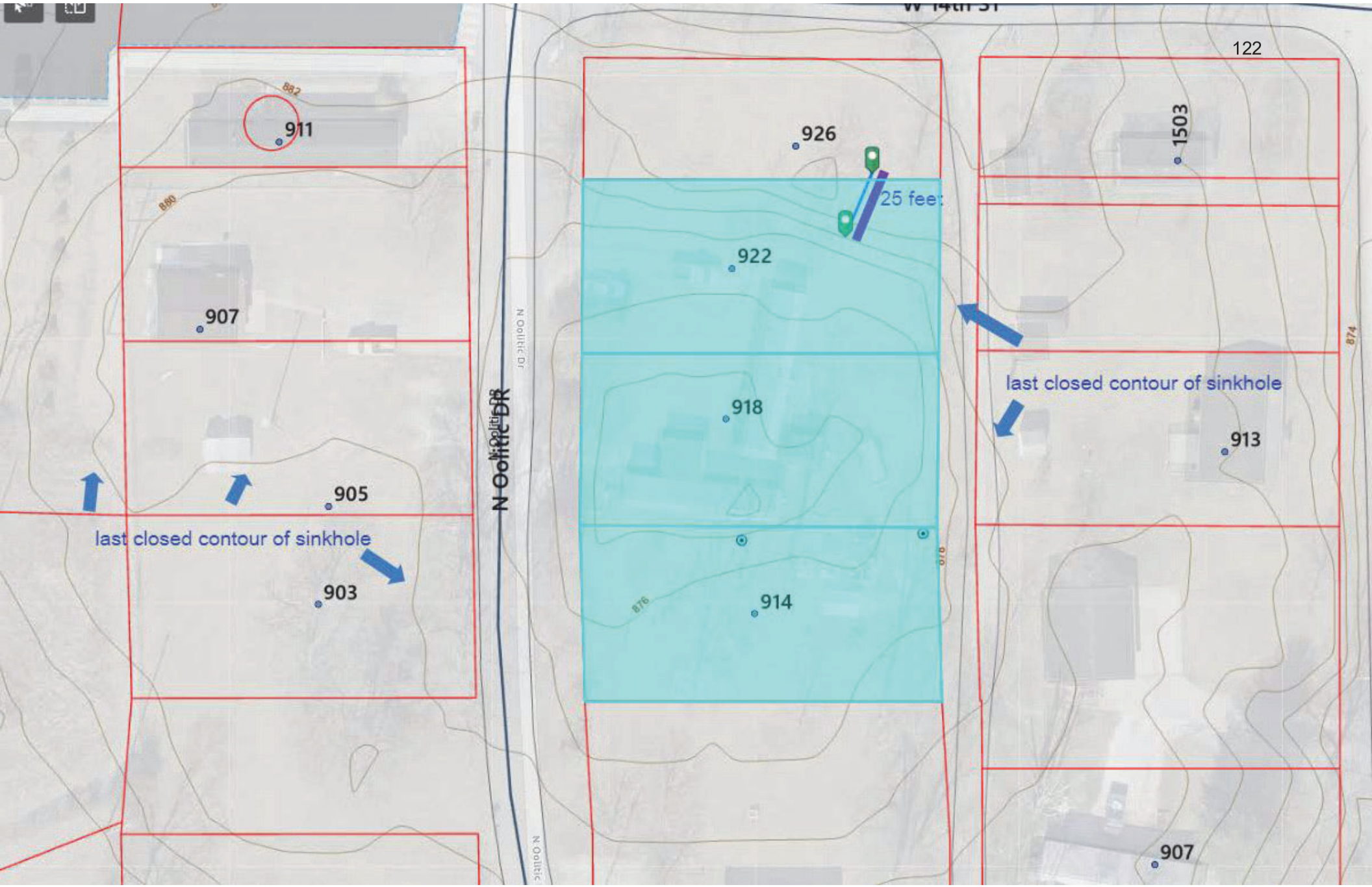


Map Legend

- Addresses
- Parcels
- Sinkholes
- Contours 2021
- Bloomington Municipal Boundary
- Mixed-Use Employment
- Planned Unit Development
- Residential Medium Lot

Created: 5/17/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.


122
911
907
905
903
926
922
918
914
25 fee
1503
913
907
last closed contour of sinkhole
last closed contour of sinkhole
N Oolitic DR

To Whom it may concern,

Ruby Creek Homes LLC (RCH) is requesting a variance from code UDO 20.04.030(g) Pursuant to Indiana Code 36-7-4-918.5.

Project Location

914, 918, 922 N Oolitic Dr.
(See Attached Survey)

Scope of Project

In 2023, 2 delapitated homes were removed from said properties (Demo Permit #s R-23-610, R-23-612) for the:

Purpose of New Home Construction

See Attached Site Plan

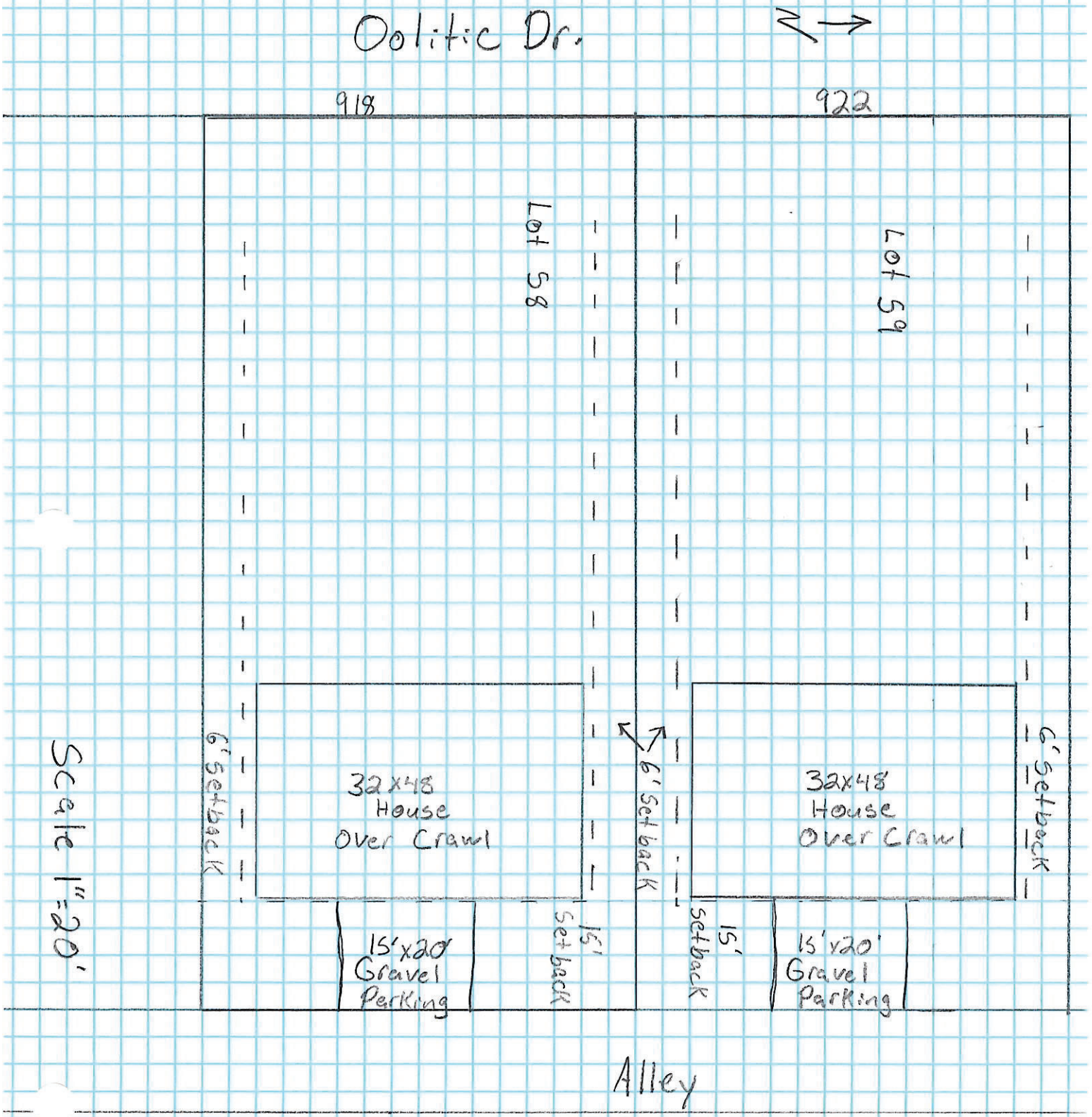
Difficulties

The strict application of UDO 20.04.030(g) renders the entire properties undevelopable, for which use it was previously intended. See Attached - Forrest Homes Development Recording 1927
Granting the requested Variance would:
Improve neighboring Property values
And would be an asset rather than a liability to public health safty and general welfare of the community by providing much needed and deficiant "Affordable Housing".

Site Plans for New Home Const.

922, 918 Oolitic Drive, Lots 58, 59

NOTE FROM STAFF: plans will likely have to change per conditions of variance -KAG



NOTE FROM STAFF: plans will likely have to change per conditions of variance -KAG

Camera 3

New Plans For:::::

Maple - C

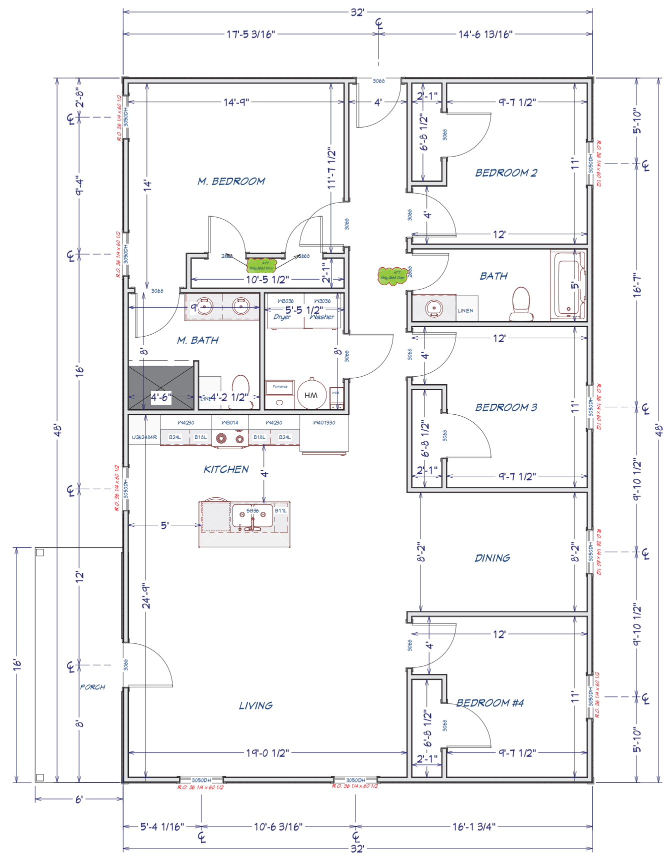
Project Overview

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

DATE: 120102/ 23

SCALE:

SHEET: P-1



LIVING AREA
1529 SQ FT

1st Floor

FRAMING NOTES :::::::::::

ALL EXTERIOR WALLS ARE SHOWN AS 4" WALLS UNLESS NOTED OTHERWISE
ALL INTERIOR WALLS ARE SHOWN AS 3 1/2" WALLS UNLESS NOTED OTHERWISE
97 1/8" WALLS UNLESS NOTED OTHERWISE
ALL EXTERIOR MEASUREMENTS TO O.S.B.
ALL INTERIOR MEASUREMENTS TO FACE OF STUD
WINDOW R.O. INCLUDED FOR SILVERLINE WINDOWS
ALL HEADER HEIGHTS AT 83" UNLESS NOTED OTHERWISE

New Plans For:::::

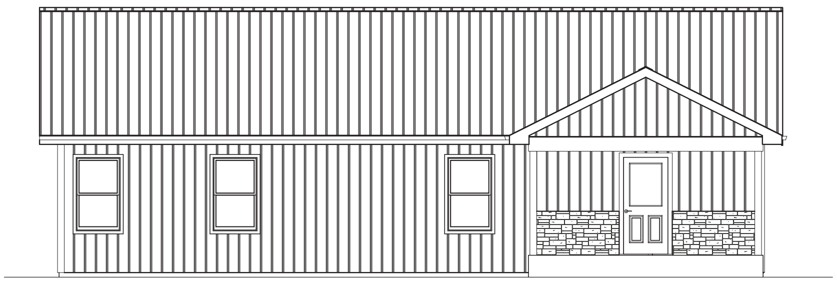
Maple - C

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

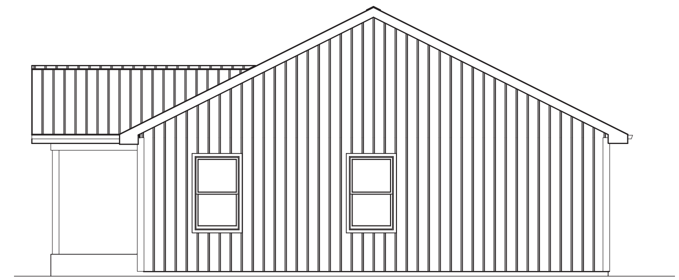
DATE: 120102/ 23

SCALE:

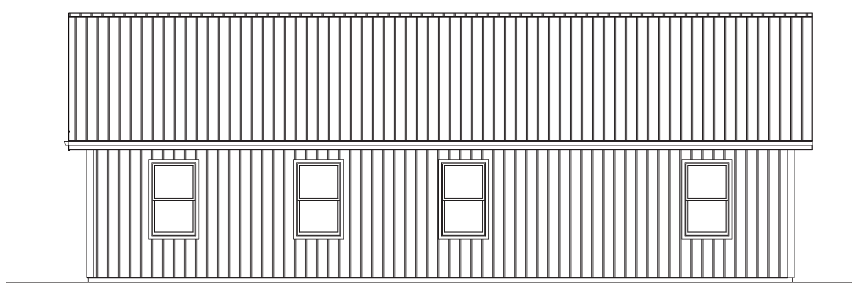
SHEET:



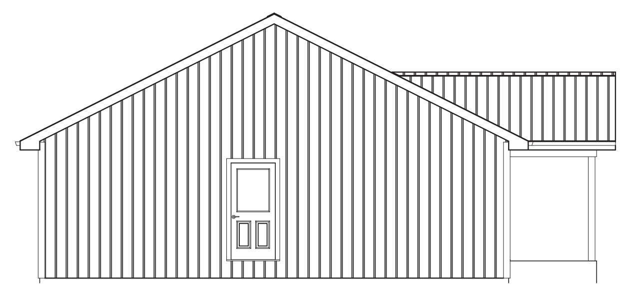
Elevation 4



Elevation 1



Elevation 3



Elevation 2

New Plans For:::::

Maple - C

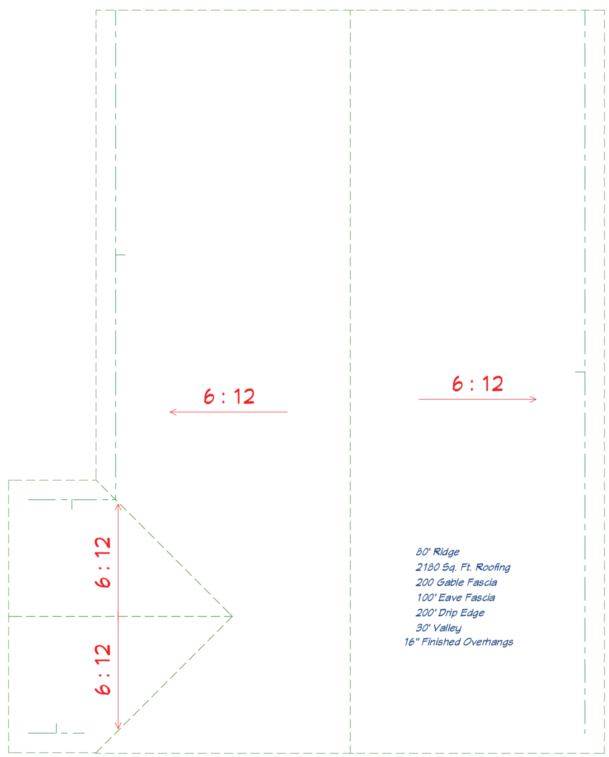
DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

DATE:

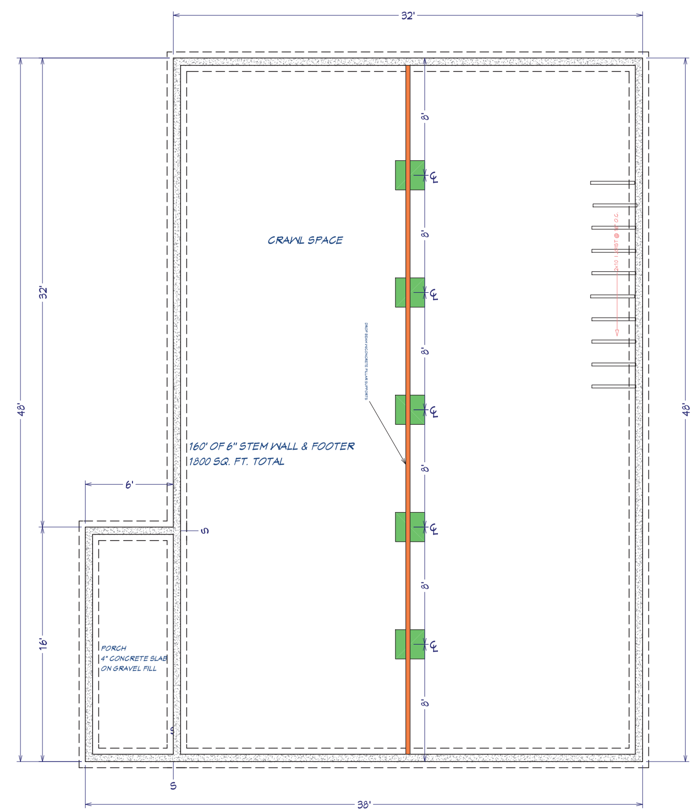
120102/23

SCALE:

SHEET:



Attic



Foundation

New Plans For::::

Maple - C

DRAWINGS PROVIDED BY:
Ken Wagler
8227 N 725 E
Odon In 47562
812-486-6328
khwagler88@sle.email

DATE:
120102/ 23

SCALE:

SHEET:


955-ROLL

REPORT OF
GEOTECHNICAL ENGINEERING EXPLORATION

OOLITIC DRIVE RESIDENCES
BLOOMINGTON, INDIANA

PREPARED FOR:

RCH, LLC
1190 EAST 1400 NORTH
ODON, INDIANA 47562

Patriot Engineering and Environmental, Inc.
2006 South Yost Avenue
Bloomington, Indiana 47403

May 6, 2024

May 6, 2024

Mr. Melvin Graber
RCH, LLC
11990 East 1400 North
Odon, Indiana 47562

Re: **Report of Geotechnical Engineering Exploration**
Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

Dear Melvin:

Attached is the report of our geotechnical engineering exploration for the above referenced project. This exploration was completed in general accordance with our Proposal No. P24-0688-11G dated March 25, 2024.

This report includes detailed and graphic logs of six (6) soil borings drilled at the proposed project site. Also included in the report are the results of laboratory tests performed on samples obtained from the site, and geotechnical recommendations pertinent to the site development, foundation design, and construction.

We appreciate the opportunity to perform this geotechnical engineering exploration and are looking forward to working with you during the construction phase of the project. If you have any questions regarding this report or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Mark Jonard, E.I.
Geotechnical Engineer

WILLIAM D. DUBOIS REGISTERED 60018167 STATE OF INDIANA PROFESSIONAL ENGINEER

William D. Dubois, P.E.
Senior Principal Engineer

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APPENDICES

Appendix A: Site Vicinity Map (Figure No. 1)
Boring Location Map (Figure No. 2)
Boring Logs
Boring Log Key
Unified Soil Classification System (USCS)

Appendix B: Seismic Site Class Evaluation

Appendix C: General Qualifications
Standard Clause for Unanticipated Subsurface Conditions

REPORT OF GEOTECHNICAL ENGINEERING EXPLORATION

Oolitic Drive Residences
922 Oolitic Drive
Bloomington, Indiana
Patriot Project No.: 24-0455-11G

1.0 INTRODUCTION

1.1 General

RCH, LLC is planning the construction of a three (3) small single-family homes to be located at the three (3) lots at 922 North Oolitic Drive in Bloomington, Indiana. The results of our geotechnical engineering exploration for the project are presented in this report.

1.2 Purpose and Scope

The purpose of this exploration is to determine the general near surface and subsurface conditions within the project area and to develop the geotechnical engineering recommendations necessary for the design and construction of the proposed structures. This was achieved by drilling soil borings, and by conducting laboratory tests on samples taken from the borings. This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and recommendations to aid in the design and construction of the proposed facility.

2.0 PROJECT INFORMATION

The proposed project is located along Oolitic Drive in Bloomington, Indiana. The project consists of three (3) single-family homes being built. These homes will be one (1)-story structures of slab-on-grade construction, approximately 32 feet by 48 feet of in plan dimension.

No structural loading information is available to us at the time of this report, but based on similar projects in the area, we can estimate that the proposed structures will have wall loads not exceeding 1,500 pounds per lineal feet (plf), isolated column loads not exceeding 60 kips, and that floor loads will not exceed 150 pounds per square foot (psf). Additionally, based on visual observations of the existing site, it is assumed that any grade raise fill to complete the construction of building pads, finished pavement subgrades, etc., will not exceed 2 feet above the existing ground surface.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The project site is presently an approximately 0.6 acres used for residential purposes. There were previously two (2) modular homes that were removed prior to our mobilization. The surrounding area is generally an area of residential development. The topography in the area proposed for construction is slopped down towards the center of the site, where a recorded sinkhole, per the Indiana Sinkhole Inventory provided by the Indiana Geological Survey, is present. Although the proposed buildings are not planned to be placed above the sinkhole, remediation is require for the project.

3.2 General Subsurface Conditions

Our interpretation of the subsurface conditions is based upon six (6) soil borings drilled at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". All depths discussed below refer to depths below the existing ground surface. Based on the results of the soil borings completed at the site, the following subsurface profile is presented. A description of each general soil unit has been identified and is described below:

Topsoil – Topsoil, a surficial layer of material that is a blend of silts, sands, and clays, with varying amounts of organic matter, was encountered at the ground surface at all of the six (6) boring locations. The topsoil layer was about 3 to 8 inches thick in the borings.

Silty Clay (CL) - The surficial layer is generally underlain by brown, slightly moist to very moist, soft to very stiff, silty clay. The silty clay layers extended to depths of 6 to 13.5 feet below the existing ground surface. The natural moisture content of this material ranges from 16 to 29 percent (%). The silty clay layers have unconfined compressive strengths, as determined by a hand penetrometer, of 1.9 to 4.5 tons per square foot (tsf). Standard Penetration Test N-values in this material varied from 4 to 23 blows per foot (bpf). Additionally, fill material, such as asphalt, gravel, brick and organics, was observed in multiples borings to varying depths (see the Table 1 below).

Clay (CH) - The silty clay layer is underlain by red, moist to very moist, medium stiff to hard, *High plasticity* clay. The clay layers extended to depths of 10 to 20 feet below the existing ground surface. The natural moisture content of this material ranges from 26 to 40 %. The silty clay layers have unconfined compressive strengths of 3.0 to 3.9 tsf. Standard Penetration Test N-values in this material varied from 13 to greater than 50 bpf.

Limestone – Below the clay layers at auger refusal, highly weather limestone was present.

The soil conditions described above are general, and some variations in the descriptions should be expected; for more specific information, please refer to the boring logs presented in Appendix "A". It should be noted that the dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. In-situ stratification changes could occur gradually or at different depths.

As previously mentioned, soft clays and unsuitable fill material were encountered in four (4) of the six (6) borings, at depths up to 13.5 feet below the existing ground surface. The following table presents the extent of the unsuitable soils encountered in the borings:

Table No. 1: Summary of Unsuitable Soils Encountered in Borings

Boring Number	Soil Classification	Approximate Depth of Unsuitable Soils (feet)[1]
B-3	Silty Clay (CL) with some asphalt and gravel (FILL)	3.5 to 6
B-4	Silty Clay (CL) with some asphalt (FILL)	0 to 3.5
	Asphalt and Gravel (FILL)	3.5 to 6
B-5	Soft Silty Clay (CL) with a trace of gravel and organics (FILL)	0 to 6
B-6	Silty Clay (CL) with a trace of asphalt (FILL)	0 to 6
	Silty Clay (CL) with some gravel and brick (FILL)	6 to 13.5

[1] Represents depth below existing ground surface.

3.3 Groundwater Conditions

The term groundwater pertains to any water that percolates through the soil found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water-bearing year round.

Groundwater was observed during drilling in one (1) of the soil borings (B-5) performed at the site at depths of 13 feet below the existing ground surface. Groundwater was not observed in the remaining borings during drilling. Immediately after the borings were completed and the augers were removed from the boreholes, groundwater was not observed.

It should be recognized that fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. ***The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this exploration.***

4.0 DESIGN RECOMMENDATIONS

4.1 Basis

Our recommendations are based on data presented in this report, which include soil borings, laboratory testing, and our experience with similar projects. Subsurface variations that may not be indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected.

4.2 Overall Site Evaluation

The borings indicate that the site is mostly underlain by clayey (CL) soils with fill materials observed in multiple borings. In general, the areas near soil borings performed may be suitable for the anticipated development following removal of the fill material. The soils will then be suitable for shallow foundations, and for support of floor slabs and pavements with these undercuts and soil replacement with compacted structural fill of the near surface soils. Additional Concerns for construction are listed below.

Expansive (Highly Plastic) Clays

Four (4) of the six (6) borings encountered highly plastic (expansive) clays (CH) at depths typically between about 6 and 20 feet below the existing ground surface. Expansive soils undergo volume changes upon wetting and drying. Expansive soils tend to shrink on drying and expand when the degree of saturation increases. However, the primary factors

that govern the amount of expansion of the soils are the availability of moisture and the amount and type of clay particles in the soil.

In Indiana, typically expansive soils within the upper 5 to 10 feet of the surface grade are influenced most by climatic environmental factors, which affect the water content of the soils and hence cause the soils to shrink and swell. This range of influence is generally referred to as the active zone. Foundations, floor slabs, pavements and subsurface utilities placed on or in this active zone of highly plastic (expansive) clays can be subjected to detrimental effects of shrink and swell; which can cause unsuitable total and/or differential settlements, along with cracking. Therefore, we recommend that foundations, floor slabs, pavements, other infrastructure not bear or be placed directly on highly plastic clays (CH). Positive drainage of surface water both during construction and after construction is complete will be especially important to reduce the amount of surface water that is allowed to permeate into the subgrade soils and subsequently reduce the potential for unsuitable shrinking or swelling of the underlying highly plastic clays. Water and drainage lines should be located such that if any leakage occurs, water will not be readily accessible to foundations, floor slabs and/or pavement sections. Additionally, the installation and use of an irrigation system at the parcel is highly discouraged.

Karst

The project site is located within a region known for karstic features. Karstic areas are typically associated with the development of solution features within the soluble carbonate bedrock leading to formation of sinkholes. A sinkhole is described as “Closed depression in soil or bedrock formed by the erosion and transport of earth material from below the land surface.” Sinkholes may develop within karstic areas as a result of soil fines migrating from the overburden soil by infiltrating water flowing downward into the bedrock through solution features/channels, such as voids and clay seams within the rock. Sinkholes may consist of a relatively localized weathered feature or larger features resulting from a collapse within a void formed in the overburden soils as a result of loss of the fine soils into the bedrock features. A sinkhole was observed on-site, as well as confirmed by the Indiana Sinkhole Inventory provided by the Indiana Geological Survey. Recommendations for remediation can be found in Section 5.2. If further evaluation of karst is desired, *Patriot* can provide geophysical testing services.

4.3 Foundations

As previously mentioned, unsuitable fill material was encountered in four (4) of the six (6) to depths up to 13.5 feet below existing grade and it is highly likely that potential existing fill

materials could be present within the project area due to previous construction activities. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the footing level or below, they must be undercut 3 feet below the bottom of the foundation and replaced with well-compacted structural fill prior to construction of foundations or the footings can be extended to suitable natural soils.*** Following the excavation of the footing areas, the foundations subgrade should be visually inspected by a *Patriot* representative and probed at multiple locations at isolated footings and at every 10 feet (maximum) along wall footings using a Dynamic Cone Penetrometer (DCP) to a minimum depth of 5 feet below the footing subgrade to verify that the underlying soil has a SPT blow count of 7 or more or unconfined compressive strength of 1.0 tsf or more. Any unsuitable soils encountered at the footing subgrade or below should be removed and replaced with well-compacted structural fill.

Provided the above recommendations are followed, the proposed structure can be supported on spread footings bearing on the medium stiff to very stiff silty clay encountered at shallow depths or on new well-compacted structural fill overlying the same. These footings should be proportioned using a net allowable soil bearing pressure not exceeding 2,000 pounds per square foot (psf) for column footings or 1,500 psf for wall (strip) footings. For proper performance at the recommended design bearing pressure, foundations must be constructed in compliance with the recommendations for footing excavation inspection that are discussed in Section 5.0 *"Construction Considerations"*.

In using the above net allowable soil bearing pressures, the weight of the foundation and backfill over the foundation need not be considered. Hence, only loads applied at or above the minimum finished grade adjacent to the footing need to be used for dimensioning the foundations. Each new foundation should be positioned so it does not induce significant pressure on adjacent foundations; otherwise the stress overlap must be considered in the design.

All exterior foundations and foundations in unheated areas should be located at a depth of at least 24 inches below final exterior grade for frost protection. We recommend that wall (strip) footings be at least 18 inches wide and column footings be at least 24 inches wide for bearing capacity considerations.

We estimate that the total foundation settlement should not exceed approximately 1 inch and that differential settlement should not exceed about ¾ inch. Careful field control during construction is necessary to minimize the actual settlement that will occur.

Positive drainage of surface water, including downspout discharge, should be maintained away from structure foundations to avoid wetting and weakening of the foundation soils both during construction and after construction is complete.

4.4 Floor Slabs

The near surface or shallow subgrade soils encountered within the proposed building footprint generally consist of medium stiff to stiff silty clay and fill material. While the silty clay material is suitable for floor slab support, the fill material is not. ***If soft clays, existing fill materials, or other unsuitable materials are encountered at the floor slab subgrade, they must be undercut and replaced with well-compacted structural fill prior to construction of floor slabs.***

We recommend that all floor slabs be designed as "floating", that is, fully ground supported and not structurally connected to walls or foundations. This is to minimize the possibility of cracking and displacement of the floor slabs because of differential movements between the slab and the foundation. Although the movements are estimated to be within the tolerable limits for the structural safety, such movements could be detrimental to the slabs if they were rigidly connected to the foundations. Additionally, we recommend that all slabs should be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions.

The building floor slabs should be supported on a minimum 6 inch thick well-compacted granular base course (i.e. Indiana Department of Transportation (INDOT) No. 53 crushed stone) bearing on a suitably prepared subgrade (Refer to Section 5.0 *"Construction Considerations"*). The granular base course is expected to help distribute loads and equalize moisture conditions beneath the slab.

Provided that the recommendations above for floor slab design and construction are followed, a modulus of subgrade reaction, "K_{30}" value of 75 pounds per cubic inch (pci), is recommended for the design of ground supported floor slabs. It should be noted that the "K_{30}" modulus is based on a 30 inch diameter plate load empirical relationship.

4.5 Seismic Considerations

For structural design purposes, we recommend using a ***Site Classification of "C"*** as defined by the Indiana Building Code (modified 2012 International Building Code (IBC)). Furthermore, along with using a Site Classification of "C", we recommend the use of the

maximum considered spectral response acceleration and design spectral response acceleration coefficients provided in Table No. 2 below. Refer to Appendix "B" for *"Seismic Site Class Evaluation"* report summary.

Table No. 2: Seismic Design Spectral Response Acceleration Coefficients

Period (seconds)	Maximum Considered Spectral Response Acceleration Coefficient	Soil Factor	Design Spectral Response Acceleration Coefficient
0.2	S_S = 0.225 g	1.20	S_{DS} = 0.180 g
1.0	S_1 = 0.107 g	1.69	S_{D1} = 0.121 g

These values were obtained from the *"Earthquake Ground Motion Parameters"* program for seismic design, developed by the United States Geological Survey (USGS) Earthquake Hazard Program, utilizing latitude 39.175149° north and longitude 86.5534332° west as the designation for identifying the location of the parcel. Other earthquake resistant design parameters should be applied consistent with the minimum requirements of the Indiana Building Code.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

All areas that will support foundations, floors, pavements or newly placed structural fill must be properly prepared. All loose surficial soil or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include: frozen soil, relatively soft material, relatively wet soils, deleterious material, or soils that exhibit a high organic content.

Approximately 3 to 8 inches of loose surficial topsoil was encountered in the borings. The topsoil was measured at discrete locations as shown on the Boring Location Map (Figure No. 2) in Appendix "A". The topsoil thickness measured at the boring locations may or may not be representative of the overall average topsoil thickness at the site. Therefore, it is possible that the actual stripping depth could significantly vary from this data. The data presented should be viewed only as a guide to the minimum stripping depth that will be

required to remove organic material at the surface. Additional field exploration by *Patriot* would be required to provide an accurate estimate of the stripping depth. This limited data indicates that a minimum stripping depth will be required to remove the organic material at the surface, followed by the potential for additional stripping and/or scarification and recompaction as may be required to achieve suitable subgrade support. ***Additionally, if saturated conditions exist with the surface soils, light tracked equipment could be required to avoid pushing organics deeper into the suitable subgrade soils.*** A *Patriot* representative should verify the stripping depth at the time grading operations occur.

Prior to construction of floor slabs, pavements or the placement of new structural fill, the exposed subgrade must be evaluated by a Patriot representative; which will include proofrolling of the subgrade. Proofrolling should consist of repeated passes of a loaded, pneumatic-tired vehicle such as a tandem-axle dump-truck or scraper. The proofrolling operations should be observed by a *Patriot* representative, and the proofrolling vehicle should be loaded as directed by *Patriot*. Any area found to rut, pump, or deflect excessively should be compacted in-place or, if necessary, undercut and replaced with structural fill, compacted as specified in Section 5.3 *"Structural Fill and Fill Placement Control"*.

Care must be exercised during grading and fill placement operations. ***The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction.*** The contractor must exercise discretion when selecting equipment sizes and also make a concerted effort to control construction traffic and surface water while the subgrade soils are exposed. We recommend that heavy construction equipment (i.e. dump trucks, scrapers, etc.) be rerouted away from the building and pavement areas. If such problems do arise, the operations in the affected area should be halted and the *Patriot* representative contacted to evaluate the condition.

5.2 Sinkhole Remediation

The actual method used for the treatment of sinkholes is typically dependent on the depth to bedrock and the intended purpose of the area subjected to remediation. Several acceptable methods of treatment are discussed below.

If the depth to the top of bedrock is greater than 15 feet the following should be performed:

- Remove all debris from the hole

- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density

Please refer to Illustration A at the end of this report.

If the depth to the top of bedrock is less than 15 feet the following should be performed:

- Remove all debris from the hole
- Excavate to the top of the bedrock
- Line hole with geotextile fabric (Mirafi 160N or equivalent), the geotextile fabric should be placed so that there is enough excess fabric to completely wrap the stone
- Backfill with No. 2 Crushed Limestone
- Wrap stone in geotextile fabric
- Place 1 foot of compacted crushed limestone (DGA), compacted to 100% of standard proctor maximum dry density
- Place min 2 feet thick compacted clay soil cap, clay soil should be compacted to 100% of Standard Proctor maximum dry density
- Or instead of crushed limestone and soil cap, place 1-foot reinforced concrete cap

Please refer to Illustrations B and C at the end of this report.

5.3 Foundation Excavations

Upon completion of the foundation excavations and prior to the placement of reinforcing steel, a *Patriot* representative should check the exposed subgrade to confirm that a bearing surface of adequate strength has been reached. Any localized soft soil zones encountered at the bearing elevations should be further excavated until adequate support soils are encountered. The cavity should be backfilled with structural fill as defined below, or the footing can be poured at the excavated depth. Structural fill used as backfill beneath footings should be limited to lean concrete, well-graded sand and gravel, or crushed stone placed and compacted in accordance with Section 5.3 *"Structural Fill and Fill Placement Control"*.

If it is necessary to support spread footings on structural fill, the fill pad must extend laterally a minimum distance beyond the edge of the footing. The minimum structural pad

width would correspond with a point at which an imaginary line extending downward from the outside edge of the footing at a 1H:2V (horizontal: vertical) slope intersects the surface of the natural soils. For example, if the depth to the bottom of excavation is 4 feet below the bottom of the foundation, the excavation would need to extend laterally beyond the edge of the footing at least 2 feet, as shown in Illustration "A" found at the conclusion of this report.

Excavation slopes should be maintained within all requirements set-forth by the Occupational Safety and Health Standards (OSHA), but specifically Section 1926 Subpart "P" – *"Excavations"*. We recommend that any surcharge fill or heavy equipment be kept at least 5 feet away from the edge of the excavation.

Construction traffic on the exposed surface of the bearing soil will potentially cause some disturbance of the subgrade and consequently loss of bearing capacity. However, the degree of disturbance can be minimized by proper protection of the exposed surface.

5.4 Structural Fill and Fill Placement Control

Structural fill, defined as any fill which will support structural loads, should be clean and free of organic material, debris, deleterious materials and frozen soils. Samples of the proposed fill materials should be tested prior to initiating the earthwork and backfilling operations to determine the classification, the natural and optimum moisture contents and maximum dry density and overall suitability as a structural fill. ***Structural fill should have a liquid limit less than 40 and a plasticity index less than 20.***

All structural fill beneath floor slabs, adjacent to foundations and over foundations, should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698). This minimum compaction requirement should be increased to 100 percent (%) of the maximum Standard Proctor dry density for fill supporting footings, provided these are designed as outlined Section 4.0 *"Design Recommendations"*.

Structural fill supporting, around and over utilities should be compacted to at least 95 percent (%) of its maximum Standard Proctor dry density (ASTM D-698) for utilities underlying structural areas (i.e. buildings, pavements, sidewalks, etc.). However, the minimum compaction requirement can be reduced for backfill around and over the utilities to 90 percent (%) of the maximum Standard Proctor dry density where utilities underlie greenbelt areas (i.e. grassy lawns, landscaping, etc.). It is recommended that a

clean well-grade granular material be utilized as the bedding material, as well as the backfill material around and over the utility lines.

In cut areas, where pavement sections are planned, the upper 10 inches of subgrade should be scarified and compacted to a dry density of at least 100 percent (%) of the Standard Proctor maximum dry density (ASTM D-698). Any grade-raise fill placed within 1 foot of the base of the pavement section should also be compacted to at least 100 percent (%) of the Standard Proctor maximum dry density. This can be reduced to 95 percent (%) for structural fill placed more than 1 foot below the base of the pavement section.

To achieve the recommended compaction of the structural fill, we suggest that the fill be placed and compacted in layers not exceeding 8 inches in loose thickness (the loose lift thickness should be reduced to 6 inches when utilizing small hand compactors) and within the range of 2 percentage (%) points below or above the optimum moisture content value. All fill placement should be monitored by a *Patriot* representative. ***Each lift should be tested for proper compaction at a frequency of at least one (1) test every 2,500 square feet (ft^2) per lift for the building areas, at least one (1) test every 10,000 square feet (ft^2) per lift for the parking and roadway areas, and at a frequency of at least one (1) test for every 50 lineal feet of utility installation.***

5.5 Groundwater Considerations

Groundwater was observed during our field activities at depths between 13 feet below the existing ground surface (Refer to Section 3.3 *"Groundwater Conditions"*); which is expected to be below the anticipated foundation excavation depths. Depending on seasonal conditions, localized and sporadic groundwater infiltration may occur into the building foundation excavations on this site.

Groundwater inflow into shallow excavations **above** the groundwater table is expected to be adequately controlled by conventional methods such as gravity drainage and/or pumping from sumps. More significant inflow can be expected in deeper excavations **below** the groundwater table requiring more aggressive dewatering techniques, such as well or wellpoint systems. For groundwater to have minimal effects on the construction, foundation excavations should be constructed and poured in the same day, if possible.

6.0 EXPLORATIONAL PROCEDURES

6.1 Field Work

A total of six (6) soil borings were drilled, sampled, and tested at the project site on April 17, 2024 at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix "A". The soil borings were drilled to depths of 20 feet in the proposed building area. All depths are given as feet below the existing ground surface.

The borings were advanced using 3¼ inch inside diameter hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2 inch outside diameter by $1^3/_8$ inch inside diameter split-spoon sampler was driven a total of 18 inches with the number of blows of a 140 pound hammer falling 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5 feet intervals, beginning at a depth of 1 foot below the existing surface grade, extending to a depth of 10 feet, and at 5 feet intervals thereafter to the termination of the boring.

Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings prior to demobilization for safety considerations.

Upon completion of the boring program, all of the samples retrieved during drilling were returned to *Patriot*'s soil testing laboratory where they were visually examined and classified. A laboratory-generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual examination. Test boring logs and a description of the classification system are included in Appendix "A" in this report. Indicated on each log are: the primary strata encountered, the depth of each stratum change, the depth of each sample, the Standard Penetration Test results, groundwater conditions, and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

6.2 Laboratory Testing

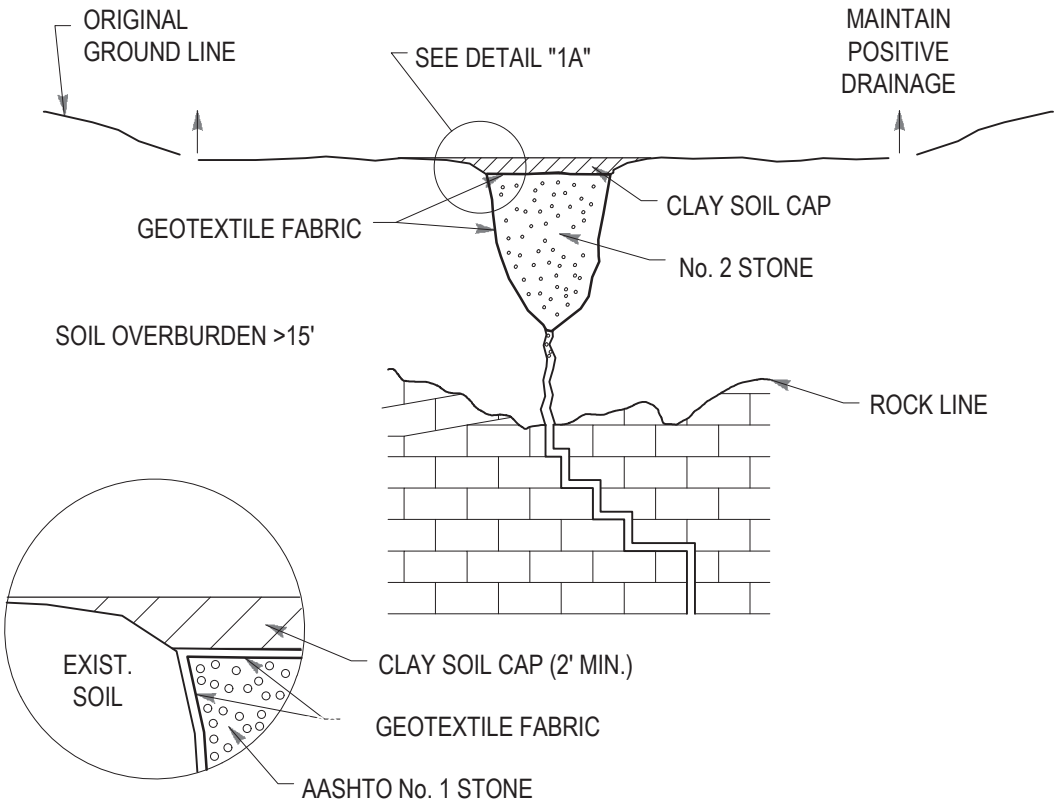
Representative samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. Laboratory analysis included: natural moisture content determinations (ASTM D 2216) and an

estimate of the unconfined compressive strength (q_u) of the cohesive soil samples utilizing a calibrated hand penetrometer (q_p) were obtained. The results of laboratory tests are summarized in Section 3.2 *"General Subsurface Conditions"*. Soil descriptions on the boring logs are in accordance with the Unified Soil Classification System (USCS).

7.0 ILLUSTRATIONS

See Illustrations "D" and "E" on the following pages. These illustrations are presented for reference for the remediation and backfill of sinkholes presented in Section 5.2.

See Illustrations "D" and "E" on the following pages. These illustrations are presented to further visually clarify several of the construction considerations presented in Section 5.3 *"Foundation Excavations"*.



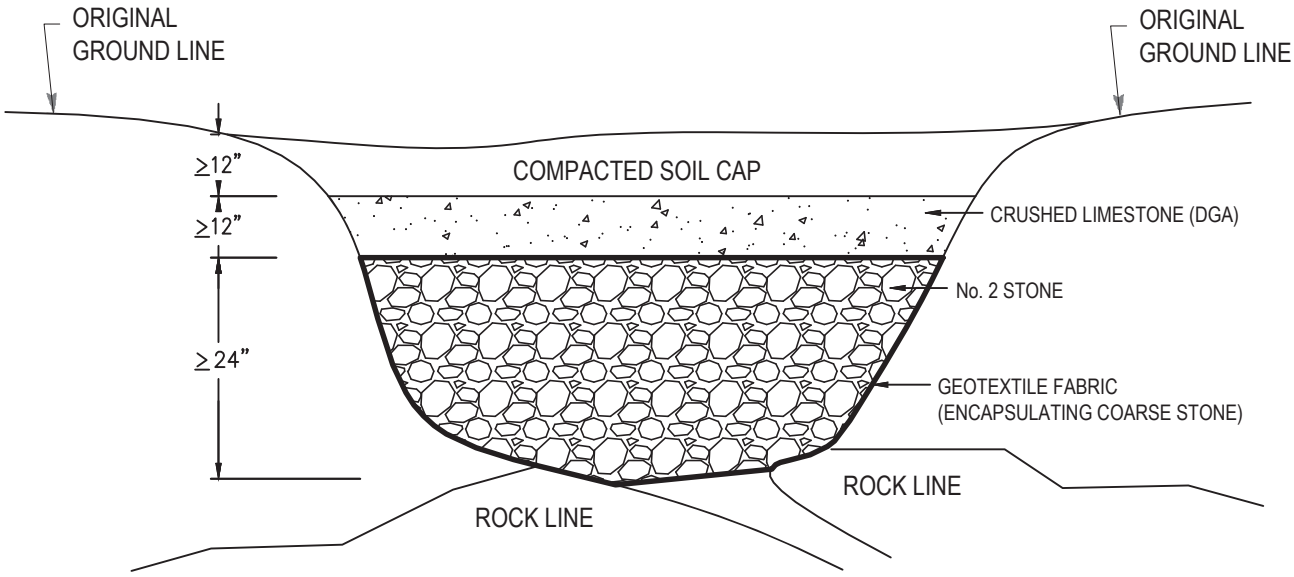
DETAIL "1A"

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration A

Treatment Method for
Deep Sink Holes



SOIL OVERBURDEN <15'

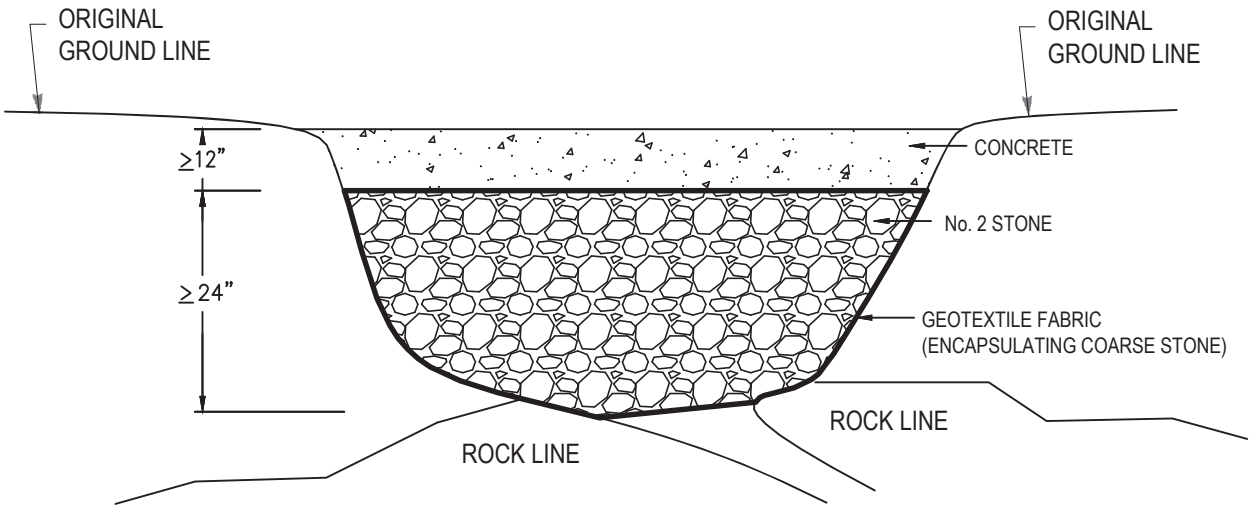
Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration B

Treatment Method for Sink Holes



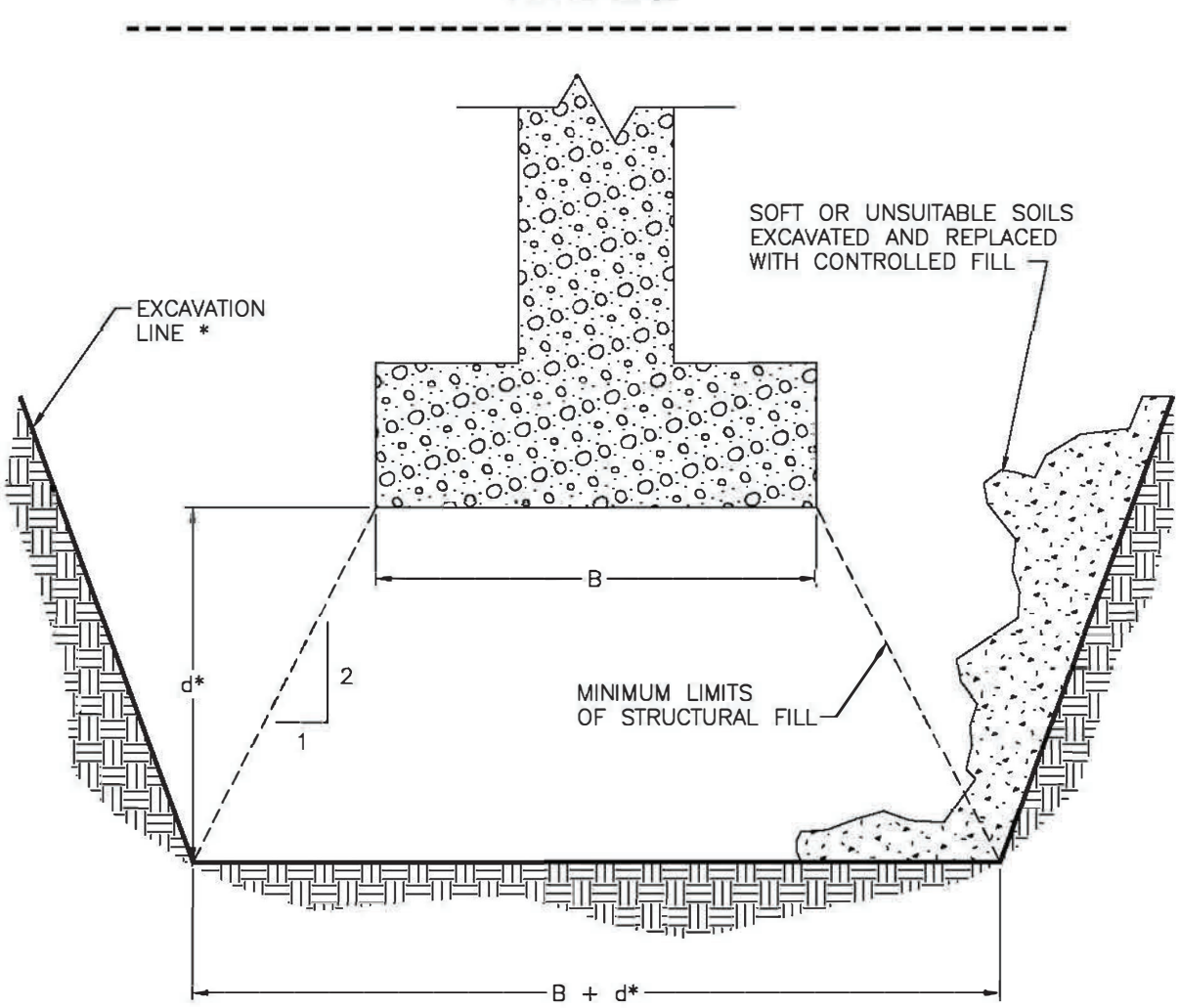
SOIL OVERBURDEN <15'

Patriot Engineering & Environmental, Inc.

Project: Oolitic Drive Residences 922 North Oolitic Drive Bloomington, Indiana	
	Drawn By: J. DuMond
Project Number:24-0455-11G	Approved: B. Lauletta
Date: May 2. 2024	DWG: 24-0455-11_detail

Illustration C

Treatment Method for Sink Holes



*d IS DEPTH TO SUITABLE SOILS

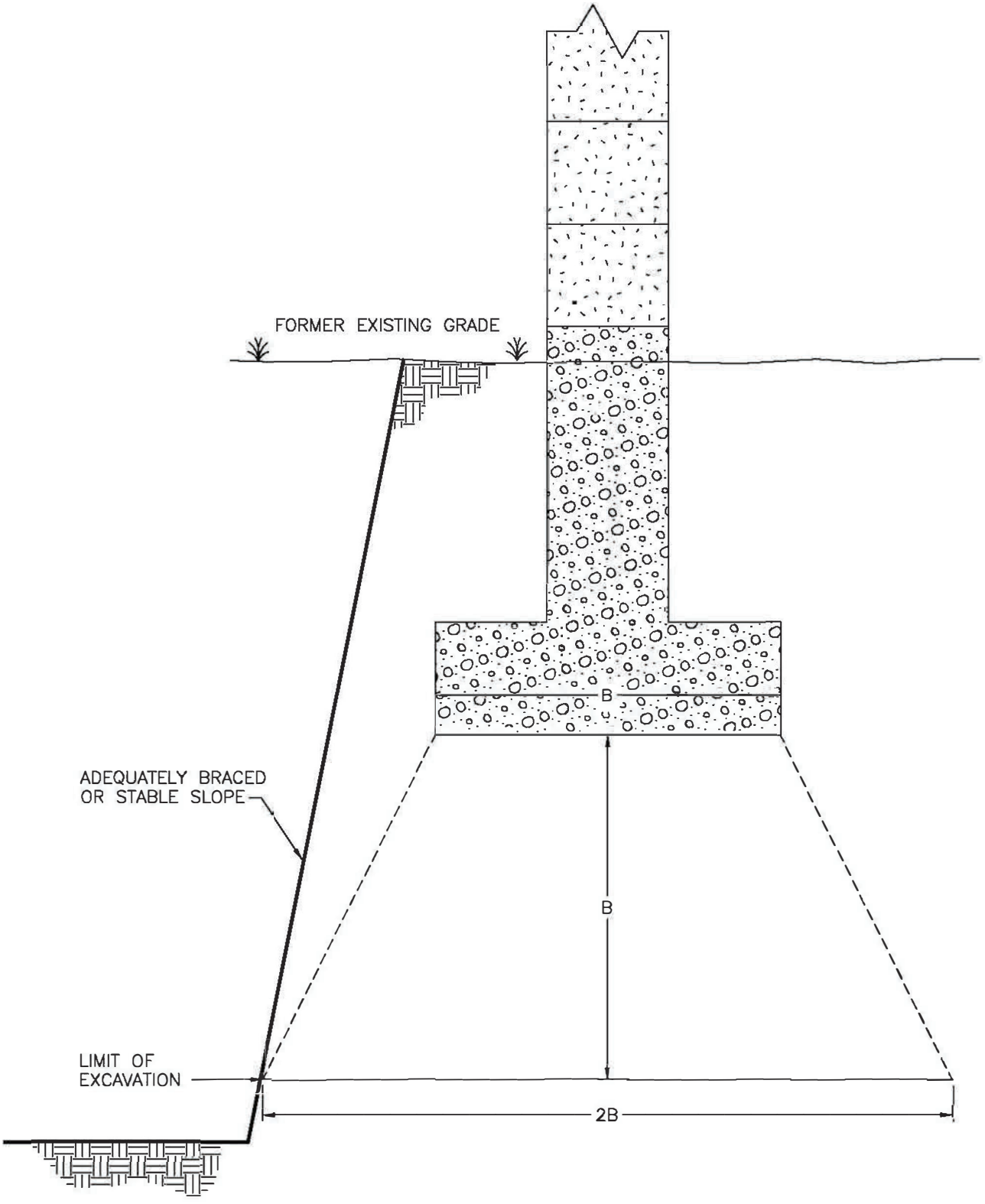
* IN COMPLIANCE WITH OSHA STANDARDS

PATRIOT ENGINEERING
and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical
and Materials Engineers

Excavation for Footings
In an Area of Fill
ILLUSTRATION D

job. no.:

figure:



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Engineering Value for Project Success
Consulting Environmental, Geotechnical
and Materials Engineers

Excavation Near Existing
In Use Foundations
ILLUSTRATION E

job. no.:

figure:

APPENDIX A

SITE VICINITY MAP (FIGURE NO. 1)

BORING LOCATION MAP (FIGURE NO. 2)

BORING LOGS

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

Patriot Engineering & Environmental, Inc.

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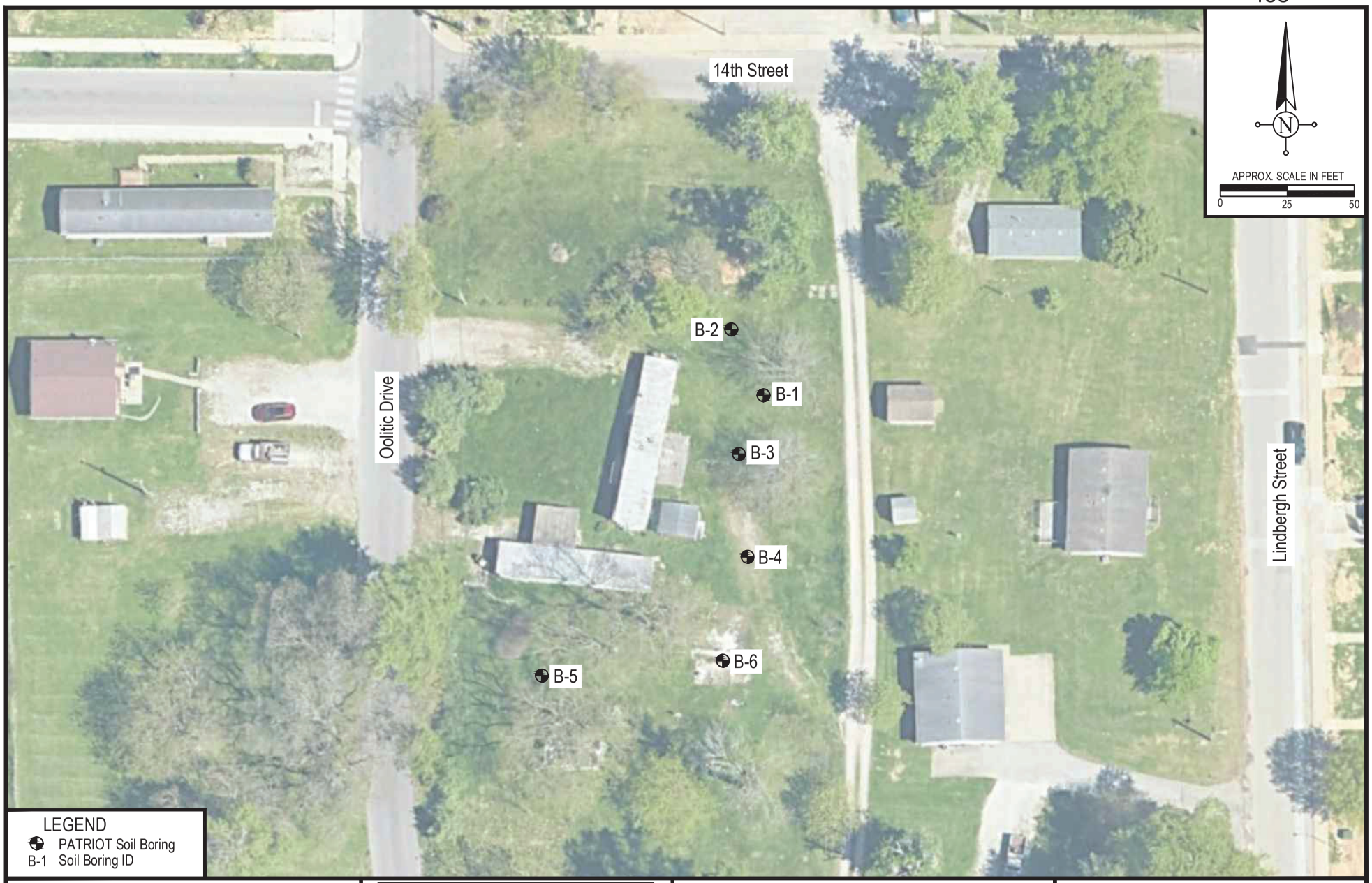
922 North Oolitic Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number:24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 1

Site Vicinity Map



Patriot Engineering & Environmental, Inc.

NOTES:
1. Boring locations were staked by PATRIOT. All locations are shown as approximate.
2. All locations were determined in the field with references to existing landmarks.
3. Image Source: Google Earth
4. Scale as shown.

Project: Oolitic Drive Residences
922 North Oolitic Drive
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Project Number: 24-0455-11	Approved: M. Jonard
Date: April 23, 2024	DWG: 24-0455-11_geo

Figure 2

Soil Boring Location Map

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-1

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 881 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.20"N
Drilling Method	: HSA	Longitude	: 86°33'11.58"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 881	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
					Red, moist to very moist, stiff to hard, SILTY CLAY	1	100	4/4/7	2.3	24	
						2	67	4/6/7	1.9	23	
5	875		CL			3	33	6/10/13	2.7	24	
						4	94	6/7/8	4.5	22	Boring caved to 8.5 feet upon auger removal.
10	870										
					Gray, highly weathered, LIMESTONE	5	17	50-3"			Auger refusal encountered at 13.5 feet.
15	865				Splitspoon refusal encountered at 13.8 feet.						Groundwater was not encountered during drilling, nor upon completion.
20	860										
25											
	855										

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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-2

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 883 feet
Start Date	: 04/17/2024	Latitude	: 39°10'32.44"N
Drilling Method	: HSA	Longitude	: 86°33'11.73"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 883	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	880		CL		Brown, very moist, stiff, SILTY CLAY with trace gravel	1	100	4/5/7		26	
5			CL		Red, very moist, stiff to very stiff, SILTY CLAY	2	89	4/7/8	2.5	26	Boring caved to 5 feet upon auger removal.
	875		CH		Red, very moist, stiff to very stiff, CLAY	3	100	4/6/8	3.0	37	
10						4	50	4/18/50-4"		28	
					Gray, highly weathered LIMESTONE						
	870				Auger refusal encountered at 12 feet						Groundwater was not encountered during drilling, nor upon completion.
15											
	865										
20											
	860										
25											

PATRIOT ENGINEERING and Environmental Inc.
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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-3

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.98"N
Drilling Method	: HSA	Longitude	: 86°33'11.69"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (4")						
			CL		Red, moist, medium stiff, SILTY CLAY	1	17	9/5/3		21	Boring caved to 2 feet upon auger removal.
	875										
			CL		Red, moist, medium stiff, SILTY CLAY with some gravel and asphalt (FILL)	2	44	1/3/3		21	
5											
			CH		Red, very moist, hard, CLAY with trace limestone	3	33	4/50-4"		40	
	870										
					Gray, highly weathered, LIMESTONE	4	44	50-4"			
10											
	865				Auger refusal encountered at 12 feet.						Groundwater was not encountered during drilling, nor upon completion.
15											
	860										
20											
	855										
25											

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Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-4

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 877 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.60"N
Drilling Method	: HSA	Longitude	: 86°33'11.65"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 877	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (3")						
	875		CL		Brown, slightly moist, stiff, SILTY CLAY with some asphalt (FILL)	1	44	4/4/6		16	
					ASPHALT and GRAVEL (FILL)	2	72	11/13/6		6	
5					Red, very moist, stiff to very stiff, CLAY	3	50	4/6/7	3.9	28	Boring caved to 6 feet upon auger removal.
	870					4	72	8/11/9	3.6	31	
10											
	865		CH								
15						5	100	7/13/10		27	
	860										
20						6	72	7/10/12		26	
	855				Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
25											

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville,
Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-5

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.17"N
Drilling Method	: HSA	Longitude	: 86°33'12.62"W

Water Levels
- During Drilling - 13.0 feet
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (5")						
					Brown, moist to very moist, soft to medium stiff, SILTY CLAY with trace gravel and organics (FILL)	1	33	1/1/24		21	
	875		CL			2	56	2/2/2		19	
5											Boring caved to 5 feet upon auger removal.
					Brown to Gray, moist to very moist, medium stiff to stiff, SILTY CLAY	3	33	4/4/4		24	
	870					4	39	3/3/4		21	
10											
	865	▼	CL			5	100	1/3/3		29	
15											
	860										
20						6	100	4/6/6		21	
	855				Boring terminated at 20 feet.						
25											

PATRIOT ENGINEERING and Environmental Inc.
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Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-6

(Page 1 of 1)

Oolitic Drive Residences
922 North Oolitic Drive
Bloomington, Indiana

Client Name	: RCH LLC	Driller	: E. Thomas
Project Number	: 24-0455-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- 878 feet
Start Date	: 04/17/2024	Latitude	: 39°10'31.23"N
Drilling Method	: HSA	Longitude	: 86°33'11.77"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 878	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (5")						
			CL		Brown, moist, stiff, SILTY CLAY with trace asphalt (FILL)	1	94	4/5/5		21	
	875					2	56	4/5/5			
5			CL		Brown, moist, medium stiff, SILTY CLAY with trace asphalt (FILL)	3	33	4/4/3		19	
	870										Boring caved to 8 feet upon auger removal.
			CL		Brown, moist, medium stiff, SILTY CLAY with some gravel and brick (FILL)	4	17	1/3/2			
10											
	865										
15			CH		Red, very moist, stiff to hard, CLAY	5	67	9/11/12	3.3	32	
	860										
						6	100	4/9/12	3.0	37	
20					Boring terminated at 20 feet.						Groundwater was not encountered during drilling, nor upon completion.
	855										
25											

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON-COHESIVE SOILS
(Silt, Sand, Gravel, and Combinations)

Density	Field Identification (SPT Blows/ft)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 51

Grain Size Terminology

Soil Fraction	Particle Size	US Standard Sieve Size
Boulders	> 12 inches	> 12 inches
Cobbles	3 - 12 inches	3 - 12 inches
Gravel: Coarse	¾ - 3 inches	¾ - 3 inches
Small	4.76 mm - ¾ inch	No. 4 - ¾ inches
Sand: Coarse	2.00 - 4.76 mm	No. 10 - No. 4
Medium	0.42 - 2.00 mm	No. 40 - No. 10
Fine	0.074 - 0.42 mm	No. 200 – No. 40
Silt	0.005 - 0.074 mm	< No. 200
Clay	< 0.005 mm	< No. 200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/ft^2)	Field Identification (SPT Blows/ft)
Very Soft	Less than 0.25	0 - 2
Soft	0.25 – < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 -15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification: Provided on Boring Logs are made by visual inspection.

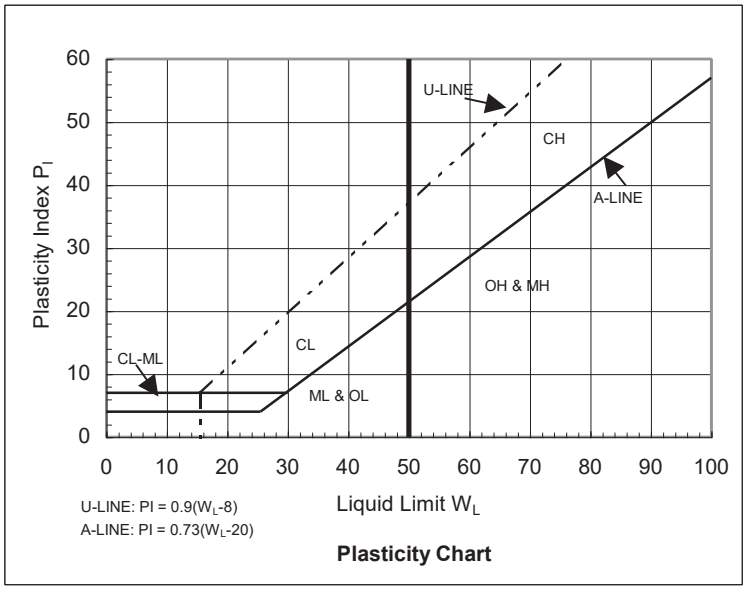
Standard Penetration Test: Driving a 2 inch outer-diameter (O.D.) by 1⅜ inch inner-diameter (I.D.) split-spoon sampler a total of 18 inches into undisturbed soil with the number of blows of a 140 pound hammer free-falling a distance of 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the “N”-value (or blow-count).

Strata Changes: In the column “Descriptions” on the Boring Logs the horizontal lines represent strata changes. A solid line (———) represents an observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater: Observations were made at the times indicated on the Boring Logs. Fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. *Groundwater symbols*: (▼)-observed groundwater level and/or elevation during drilling; (∇)-observed groundwater level and/or elevation upon completion of boring.

Unified Soil Classification System (USCS)

Major Divisions			Group Symbol		Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM	d u a l	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols	
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_c > 3$)		
		Sands with fines (appreciable amount of fines)	SM	d u a l	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols	
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (liquid limit >50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays or high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT		Peat and other highly organic soils			



Plasticity Chart

APPENDIX B

SEISMIC SITE CLASS EVALUATION

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

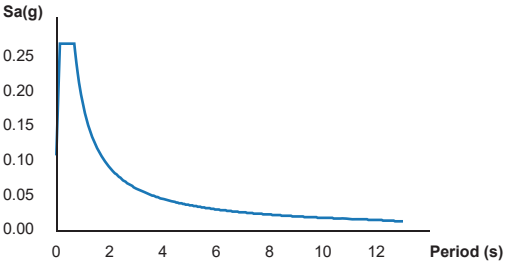
The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

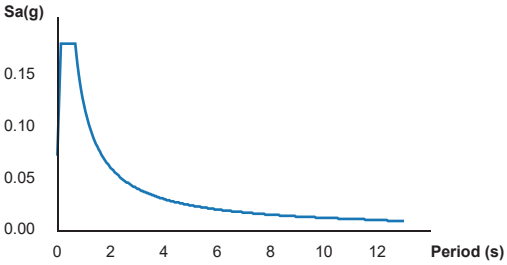
Search Information

Address:	922 N Oolitic Dr, Bloomington, IN 47404, USA
Coordinates:	39.175149, -86.5534332
Elevation:	879 ft
Timestamp:	2024-05-03T13:50:55.486Z
Hazard Type:	Seismic
Reference Document:	IBC-2012
Risk Category:	II
Site Class:	C

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.225	MCE_R ground motion (period=0.2s)
S_1	0.107	MCE_R ground motion (period=1.0s)
S_{MS}	0.269	Site-modified spectral acceleration value
S_{M1}	0.181	Site-modified spectral acceleration value
S_{DS}	0.18	Numeric seismic design value at 0.2s SA
S_{D1}	0.121	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	1.693	Site amplification factor at 1.0s
CR_S	0.9	Coefficient of risk (0.2s)
CR_1	0.854	Coefficient of risk (1.0s)
PGA	0.107	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.128	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	0.225	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.25	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.107	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.125	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)

PGAd	0.6	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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APPENDIX C

GENERAL QUALIFICATIONS

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

GENERAL QUALIFICATIONS

of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

This report may not contain sufficient information for purposes of other parties or other uses. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report. Should there be any significant differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The recommendations provided herein were developed from the information obtained in the test borings, which depict subsurface conditions only at specific locations. The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. The nature and extent of variations between borings may not become evident until the time of construction. If, after performing on-site observations during construction and noting the characteristics of any variation, substantially different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that Patriot be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

BLOOMINGTON BOARD OF ZONING APPEALS CASE #: V-15-24/ VAR-2024-04-0032
STAFF REPORT DATE: May 23, 2024

Location: 803 E Winslow Rd (parcel #53-08-09-400-002.000-009)

PETITIONER/OWNER: Sarah Nelson
2600 S Henderson St, Bloomington, IN

REQUEST: Variance from fence height standards in the Residential Small Lot (R3) zoning district.

REPORT: This 0.95 acre property is located at 803 E Winslow Street (two properties to the west of the intersection of E Winslow Rd and S Highland Ave) and is zoned Residential Small Lot (R3). Surrounding zoning districts are Residential Small Lot (R3) to the west and north, Residential Medium Lot (R2) to the east and southeast, and Residential Multifamily (RM) to the southwest. Surrounding land uses include detached single-family residential use to the north and east, "place of worship" use to the southeast, Acadia Court leasing office and multifamily residential use to the southwest, and detached single family residential use to the west. The future land use designation for this property is Neighborhood Residential.

The petitioner is requesting to place a six foot tall wooden L-shaped privacy fence at the southwest corner of the property. This privacy fence would be placed eight feet north of the southwest property corner. The fence would extend 40 feet east, parallel to the front property line and it would extend 16 feet to the north along the western property line. The purpose of this requested privacy fence is to block traffic lights and noise from E Winslow Rd and S Acadia Ct.

The property owner is also requesting to place a five foot tall woven wire fence along the West property line. This fence would connect to the north most portion of the aforementioned six foot privacy fence along the west property line and continue north along the property line to the northwest corner of the property. The purpose of the five foot woven wire fence is to delineate the property line and discourage possible trespass from development of the property to the west.

On interior lots, such as 803 E Winslow St, the Unified Development Ordinance (UDO), Title 20 of the Bloomington Municipal Code, states that fences cannot exceed four feet in height forward of the front building wall of the primary structure (which is the space between the front property line and the front building wall of the primary structure). The proposed 6-foot wooden privacy fence in the southwest corner of the property and roughly 46 feet of the proposed five-foot woven wire fence along the western property line would be placed in a location of the property where UDO maximum fence height standards are 4 feet. Therefore, a variance must be granted to allow the requested fence heights on this property.

The petitioner is requesting a variance from fence height standards in the Residential Small Lot (R3) zoning district, to allow a six-foot wooden fence and five-foot woven wire fence forward of the front building wall.

CRITERIA AND FINDINGS FOR DEVELOPMENT STANDARDS VARIANCE

20.06.080(b)(3)(E) Standards for Granting Variances from Development Standards:

A variance from the development standards of the Unified Development Ordinance may be approved only upon determination in writing that each of the following criteria is met:

1) *The approval will not be injurious to the public health, safety, morals, and general welfare of the community.*

   PROPOSED FINDING: The granting of this variance will not be injurious to the public health, safety, morals, or general welfare of the community. The six foot fence would be set 8 feet north of the multiuse path and sit below the elevation of the multiuse path. It would not interfere with or create a safety hazard for users of the path.

2) *The use and value of the area adjacent to the property included in the Development Standards Variance will not be affected in a substantially adverse manner.*

   PROPOSED FINDING: No adverse impacts to the use and value of surrounding properties as a result of the requested variance are found. The four-foot fence maximum in the UDO is intended to help promote visibility and allow for a positive interface and interactions between private property and the users of the adjacent public right-of-way. The six foot portion would extend the length of 40 feet along the right-of-way, and is eight feet north of the right-of-way line. The requested five-foot woven wire fence is transparent and thus will not block visibility between the front door of this home and the neighbor to the west.

3) *The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the Development Standards Variance will relieve the practical difficulties.*

   PROPOSED FINDING: The Department does find that the strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property and that these practical difficulties are peculiar to the property in question. This property is across the street from Acadia Ct and Acadia apartments, which generates more traffic than an average residential subdivision. Although S Arcadia Ct has been in place for over 10 years, 803 E Winslow Rd was previously protected by significant vegetation from traffic headlights traveling along E Winslow Rd and entering and leaving Acadia Apartment complex. Approval of this variance would allow the placement of a wooden privacy fence that would enable the property to continue to be used as a livable residential dwelling because the fence would be high enough to block the traffic headlights from the intersection of E Winslow Rd and Acadia Ct. that were previously shielded by the vegetation.

   The approval of this variance would allow the property owners both increased security of their residential property while also maintaining visibility and connectivity to the neighboring properties and the public ROW as desired by the UDO.

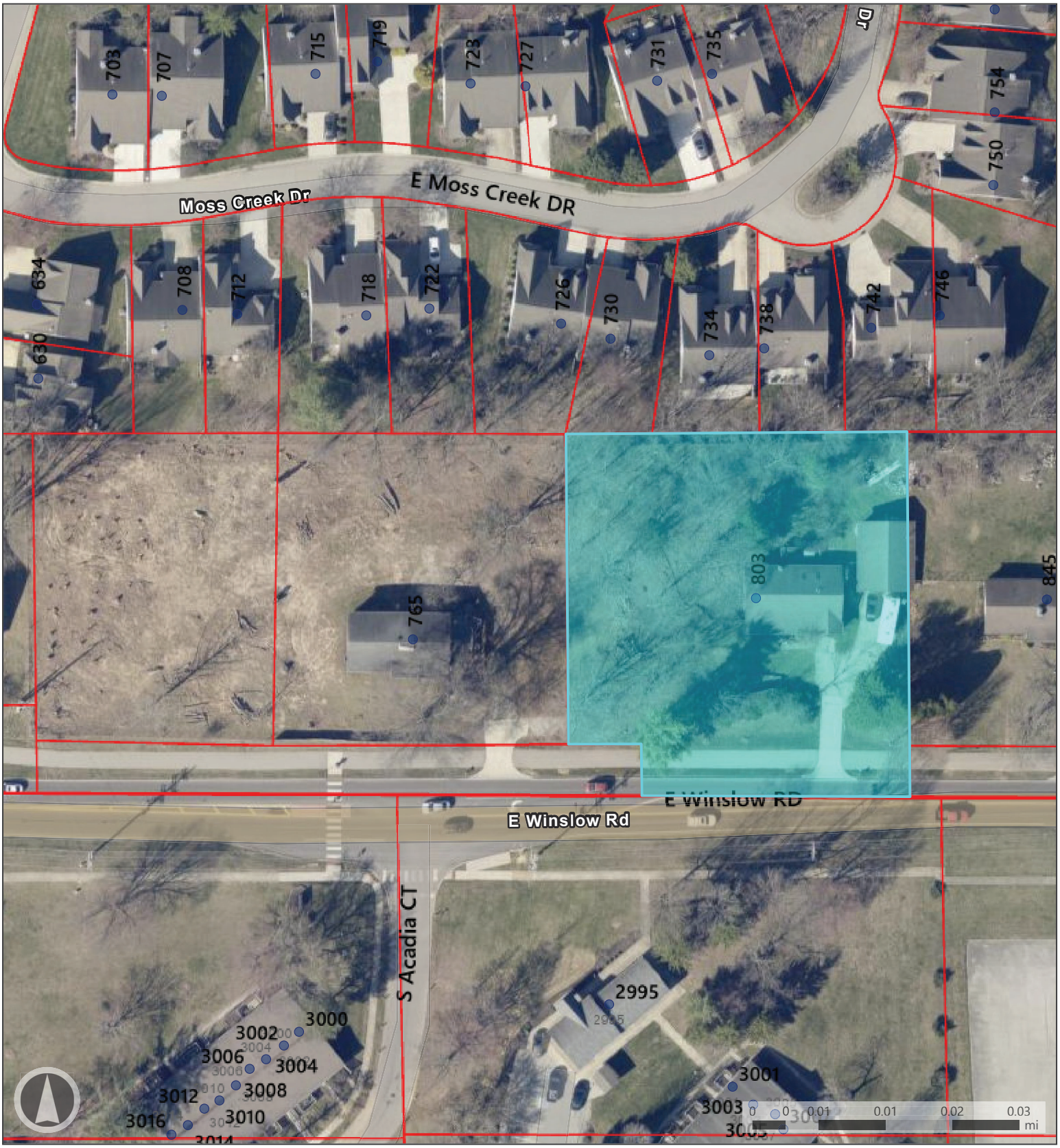
RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopt the proposed findings and approve case V-15-24/ VAR-2024-04-0032, with the following conditions:

1. The petitioners may only install the types of fencing approved in the packet for this variance, and only at the heights and locations shown.

City of Bloomington

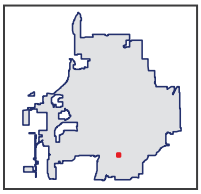
Context Aerial

803 E Winslow St (CASE #: V-15-24/ VAR-2024-04-0032)



Map Legend

- Addresses
- Parcels
- Bloomington Municipal Boundary



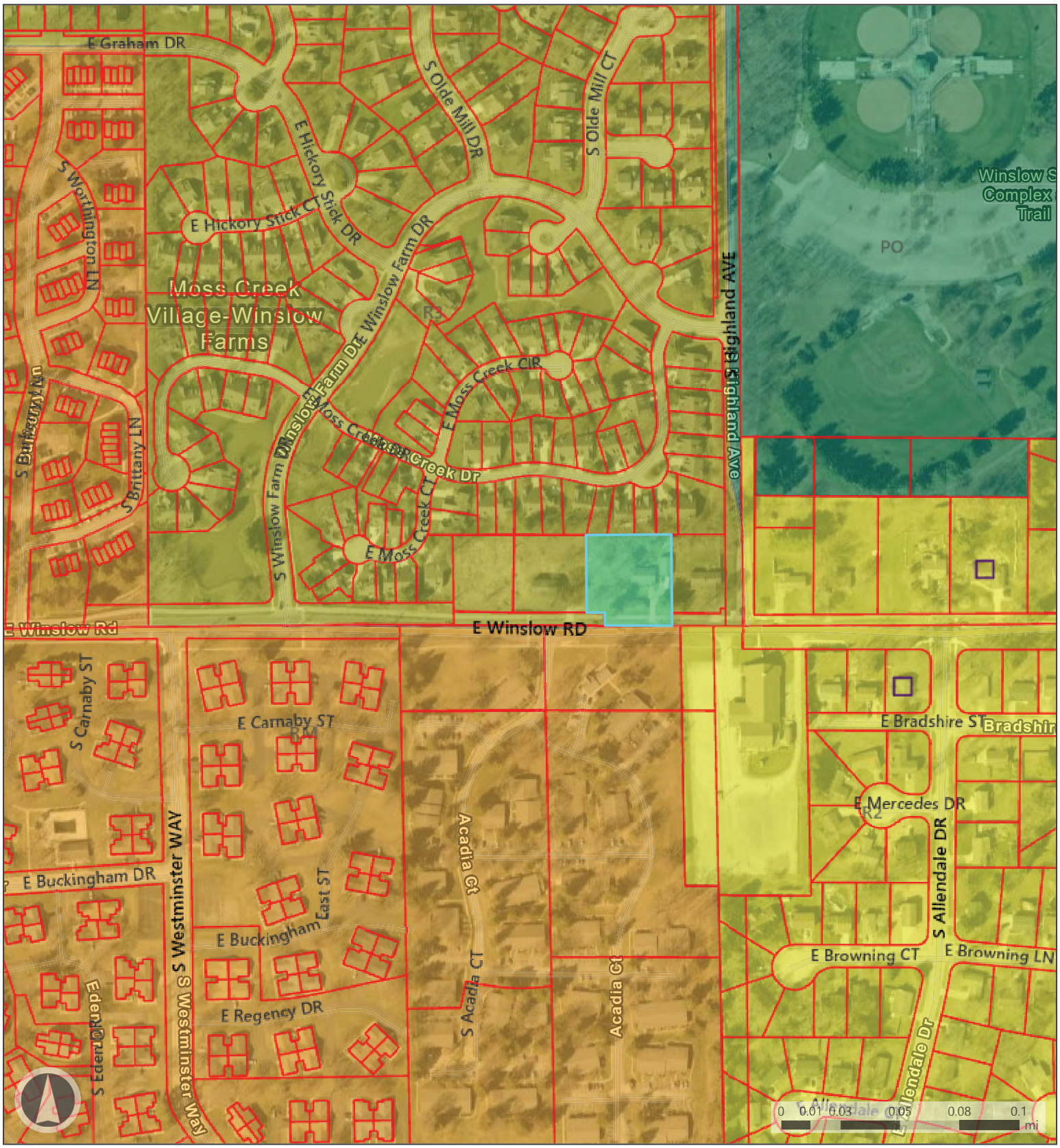
Created: 5/14/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.

City of Bloomington

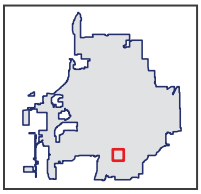
Location Map

803 E Winslow St (CASE #: V-15-24/ VAR-2024-04-0032)



Map Legend

- Parcels
- Rating
  - Contributing
- Bloomington Municipal Boundary
- Parks and Open Space
- Residential Medium Lot
- Residential Small Lot
- Residential Multifamily



Created: 5/14/2024 *Map By: Katie Gandhi*

For use as map information only, information is NOT warranted.

April 22, 2024

I. Reason for Variance Request

A. Request for variance to remediate the adverse impact of the city's construction of the pathway to the use and enjoyment of the property.

B. In the late 1960's at the request of the property owner, the local government directed placement of pines outside of the Winslow Road Right-of-Way so they would not interfere with any future plans.

C. Winslow Road was subsequently widened fully on the North side consuming the existing Right-of-Way to the North.

D. In 2019 the city obtained additional Right-of-Way to the North of Winslow Road for the pathway. In 2020 the city constructed the pathway removing the trees and underbrush that had provided screening since the early 1970's. This resulted in an open area allowing traffic light and noise to encroach unduly onto Parcel 53-08-09-400-002.000-009.

E. The house on Parcel 53-08-09-400-002.000-009 was constructed in 1992, when the trees and vegetation were already in place.

II. Background

A. Pictures #'s 1 and 2 ----looking East from the driveway at 765 E. Winslow Road show stumps of 4 mature 50+/- year old white pines that were cut out of the 40 foot road frontage where we want to put the privacy fence.

B. We have measured the four foot height along the proposed location of the privacy fence. Four feet is well below the height of headlights.

C. Pictures 3 and 4 show how open that area is now as seen from our front porch.

D. Pictures 8 and 9 show the elevation drop from Winslow Road onto the property.

E. The wooden privacy fence along the South property line would be placed eight feet North of the North edge of the pathway. The location of the privacy fence is across from a business(apartment leasing) and the entrance to a subdivision which generates more traffic. There are no houses across the street and we are not located in a subdivision.

III. Proposed Remediation

A. We propose to replace the removed vegetation screening with a six foot tall wooden privacy fence to block out traffic lights and noise. In addition, a five foot tall woven wire fence along the West property line is being requested.

B. The privacy fence would extend from a point eight feet North of the South West property corner running East 40 feet, and from that same point extending North 16 feet along the westerly property line connecting to a five foot tall woven wire fence which will then continue North along the property line to the North West property corner. The purpose of the five foot woven wire fence is to:

1) delineate the property line and, 2) discourage possible trespass from development of the property to the West. Pictures #'s 5 and 6 show the type of woven wire fence to be used. Picture #7 depicts the proposed five foot woven wire attachment to the wooden privacy fence.

IV. Compliance with General Approval Criteria BMC 20.06.080 (b)(3)(E)(i)

A. The proposed fencing will be fully on Parcel 53-08-09-400-002.000-009. It will not be on or interfere with public property, health, safety, morals, or the general welfare of the community.

B. The use and value of adjacent areas will not be substantially affected.

C. The strict application of the UDO will result in the continued practical difficulties in the use of this property (created with the construction of the pathway in 2020 and experienced since). These practical difficulties are peculiar to this parcel only, affecting no other parcels. The requested variance to the development standards (of the existing property development) will relieve the practical difficulties by largely returning the property to its previous state which existed prior to construction of the house in 1992.

PLAT OF SURVEY - ORIGINAL BOUNDARY
A PART OF THE SOUTHEAST QUARTER OF
SECTION 9, T8N, R1W, MONROE CO., INDIANA
JOB No. 11153 Client Name: Sarah Nelson and Roger Stuart

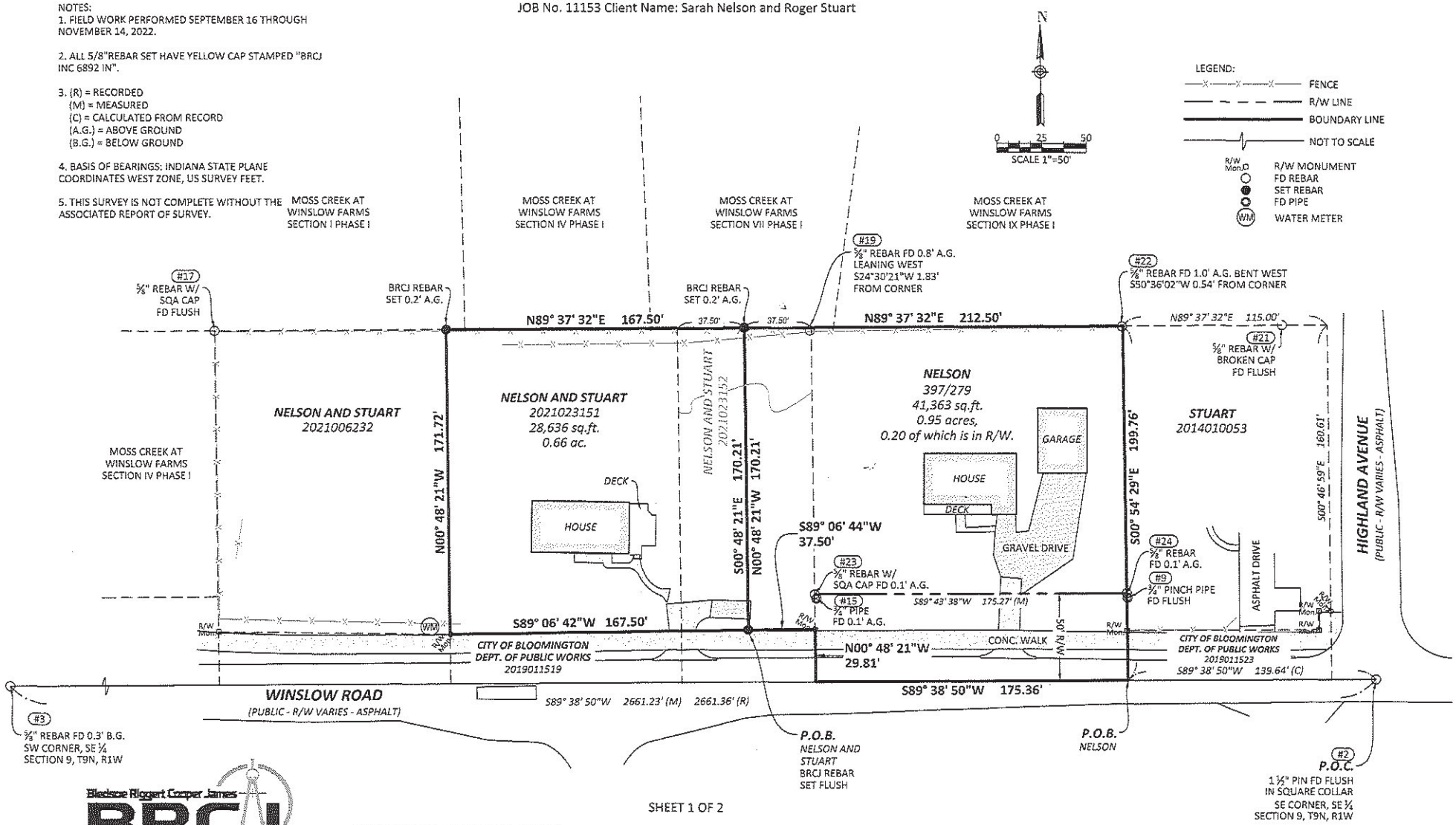
NOTES:
1. FIELD WORK PERFORMED SEPTEMBER 16 THROUGH NOVEMBER 14, 2022.

2. ALL 5/8"REBAR SET HAVE YELLOW CAP STAMPED "BRCJ INC 6892 IN".

3. (R) = RECORDED
(M) = MEASURED
(C) = CALCULATED FROM RECORD
(A.G.) = ABOVE GROUND
(B.G.) = BELOW GROUND

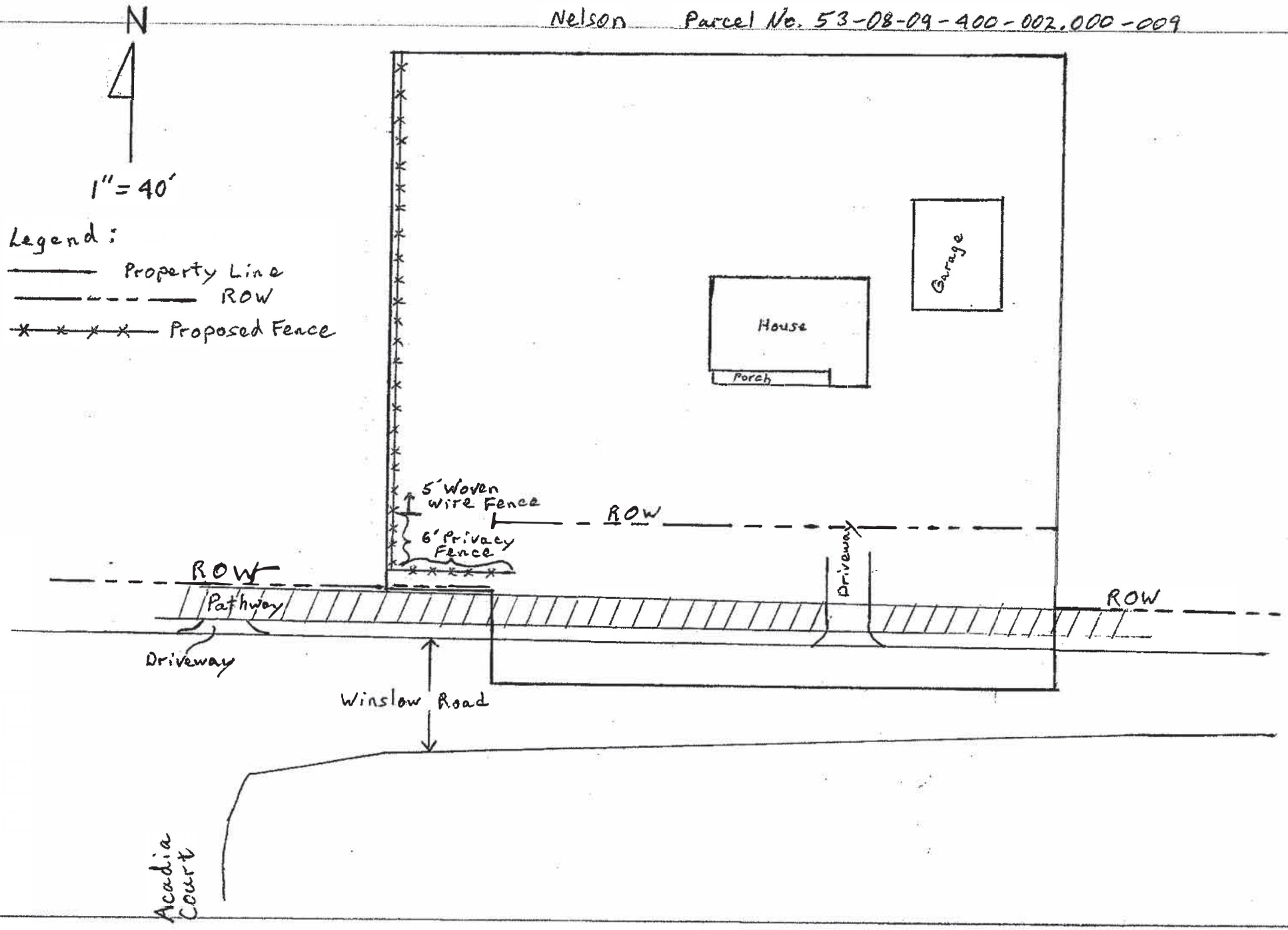
4. BASIS OF BEARINGS: INDIANA STATE PLANE COORDINATES WEST ZONE, US SURVEY FEET.

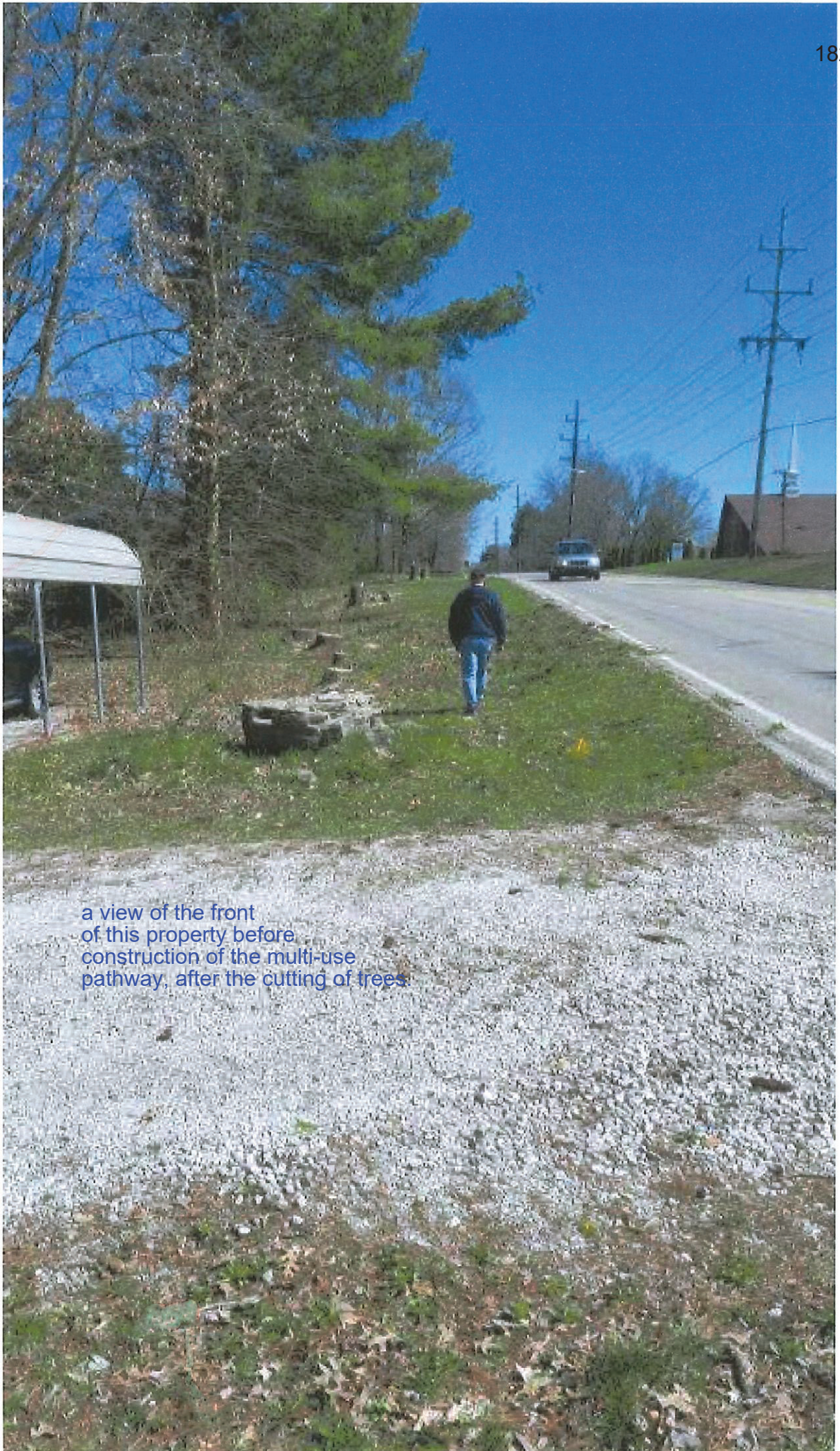
5. THIS SURVEY IS NOT COMPLETE WITHOUT THE ASSOCIATED REPORT OF SURVEY.



Bledsoe Riggert Cooper James
BRCJ
LAND SURVEYING • CIVIL ENGINEERING • GIS
Bloomington • Bedford • Paoli
1351 West Tapp Road • Bloomington, Indiana 47403 • p: 812.336.8277
BRCJcivil.com

Nelson Parcel No. 53-08-09-400-002.000-009





a view of the front
of this property before
construction of the multi-use
pathway, after the cutting of trees

(2)

3.

shows the elevation change between the street and the home, demonstrating why a four-foot fence is insufficient to block the traffic lights

shows the elevation change between the street and the home, demonstrating why a four-foot fence is insufficient to block the traffic lights

(5)

186

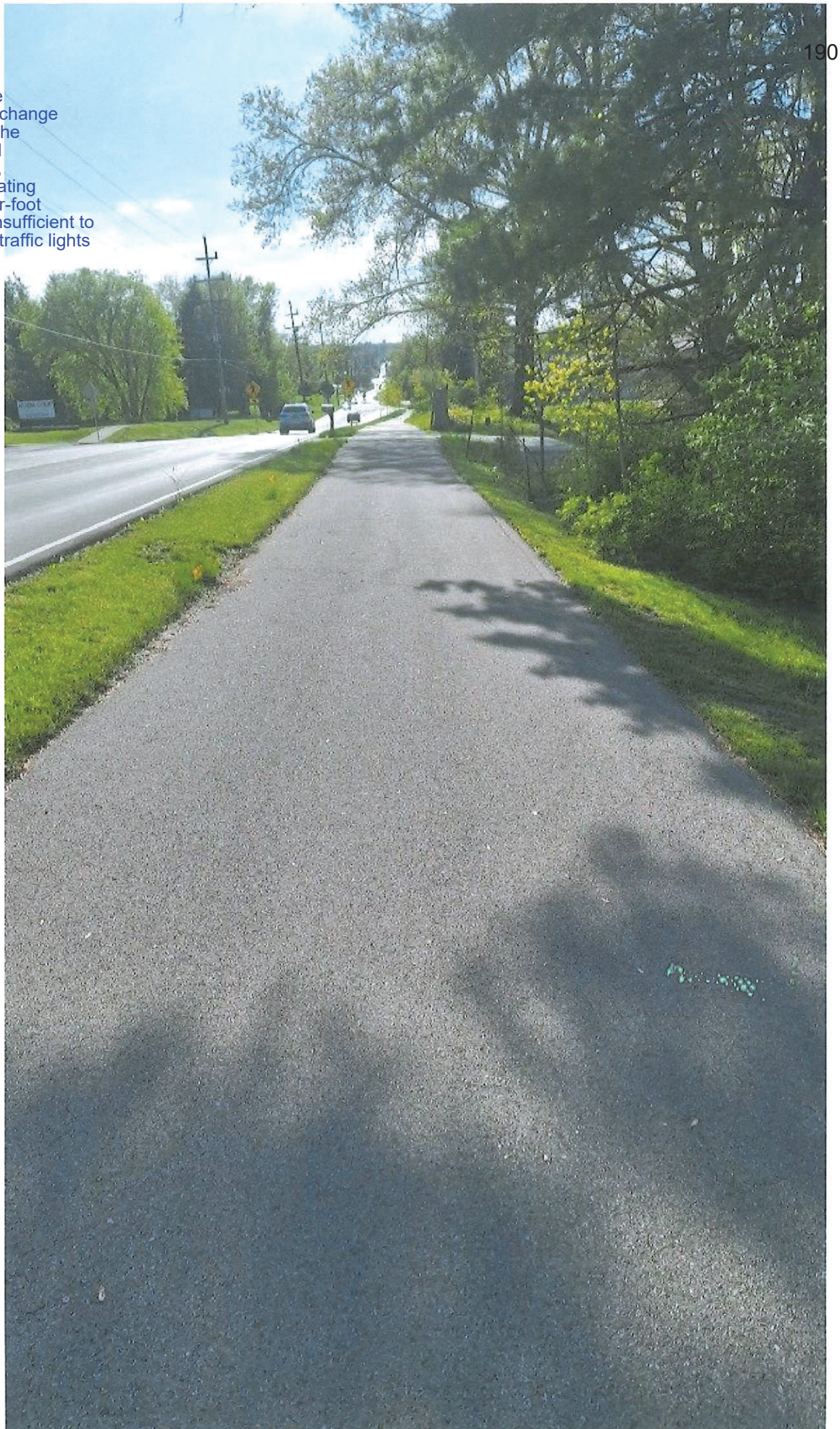
an example of the woven wire fencing that will be placed along the west edge of the property

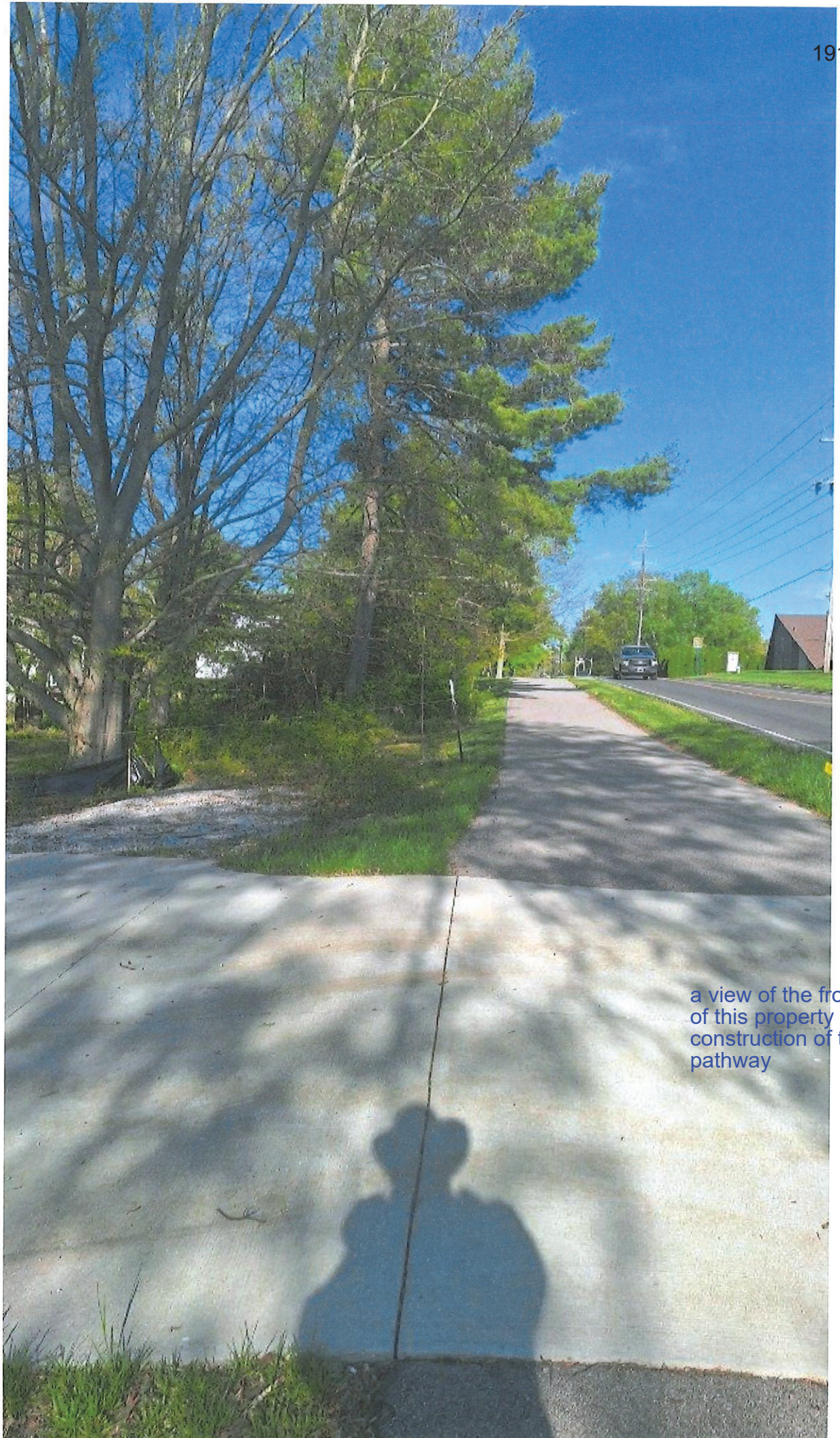
an example of the woven wire fencing that will be placed along the west edge of the property

189

an example demonstrating of how the wooden privacy fence will connect to the woven wire fencing along the west edge of property

shows the elevation change between the street and the home, demonstrating why a four-foot fence is insufficient to block the traffic lights





a view of the front
of this property after
construction of the multi-use
pathway

BLOOMINGTON BOARD OF ZONING APPEALS **CASE #: V-16-24**
STAFF REPORT **DATE: May 23, 2024**
Location: 400 N. Walnut Street

PETITIONER: Bloomington Lodge 446 Benevolent Protective Order of Elks, USA
PO Box 97, Bloomington, IN

CONSULTANTS: Stuart Baggerly
304 N. Morton Street, Bloomington, IN

REQUEST: Variance from front yard setback requirements for a flagpole in the Mixed-Use Downtown (MD) within the Downtown Core Overlay (DCO) district.

REPORT: This 0.5 acre property is located at the northeast corner of N. Walnut Street and W. 8th Street and is zoned Mixed-Use Downtown (MD) and is within the Downtown Core Overlay (DCO) district. Surrounding land uses include an office to the north, restaurants to the west and south, and single and multifamily residences to the east. The property has been developed with a local chapter of the Benevolent and Protective Order of the Elks Lodge. There are no known regulated environmental features on the property.

The petitioner recently removed a dilapidated flag pole from the front yard of the property and constructed a new concrete pad with 9 new flag poles. The UDO states that flag poles shall be located no closer than 12 feet from the front property line and one foot from side and rear property lines. Four of the nine flag poles that were installed do not meet the 12 foot setback and are 5', 7', 10', and 11' from the front property line. The location of the pad and flagpoles was the only open space on the property that was not encumbered with building or parking area. The location of the poles does not lie in any vision clearance triangles for the intersection. There is no minimum landscape area requirement for this Overlay District. The location of the concrete pad meets all UDO requirements as well.

CRITERIA AND FINDINGS FOR DEVELOPMENT STANDARDS VARIANCE
20.06.080(b)(3)(E) Standards for Granting Variances from Development Standards:

A variance from the development standards of the Unified Development Ordinance may be approved only upon determination in writing that each of the following criteria is met:

1) *The approval will not be injurious to the public health, safety, morals, and general welfare of the community.*

   PROPOSED FINDING: The granting of the variance will not be injurious to the public health, safety, morals, or general welfare of the community. The location of the flagpoles within the required setback will not have any impact on the public health, safety, morals, or general welfare of the community as they do not present a vision clearance triangle issue.

2) *The use and value of the area adjacent to the property included in the Development*

Standards Variance will not be affected in a substantially adverse manner.

PROPOSED FINDING: No adverse impacts to the use and value of surrounding properties as a result of the requested variance to allow the flagpoles in the front setback are found as they present no safety issues with their location.

3) *The strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the Development Standards Variance will relieve the practical difficulties.*

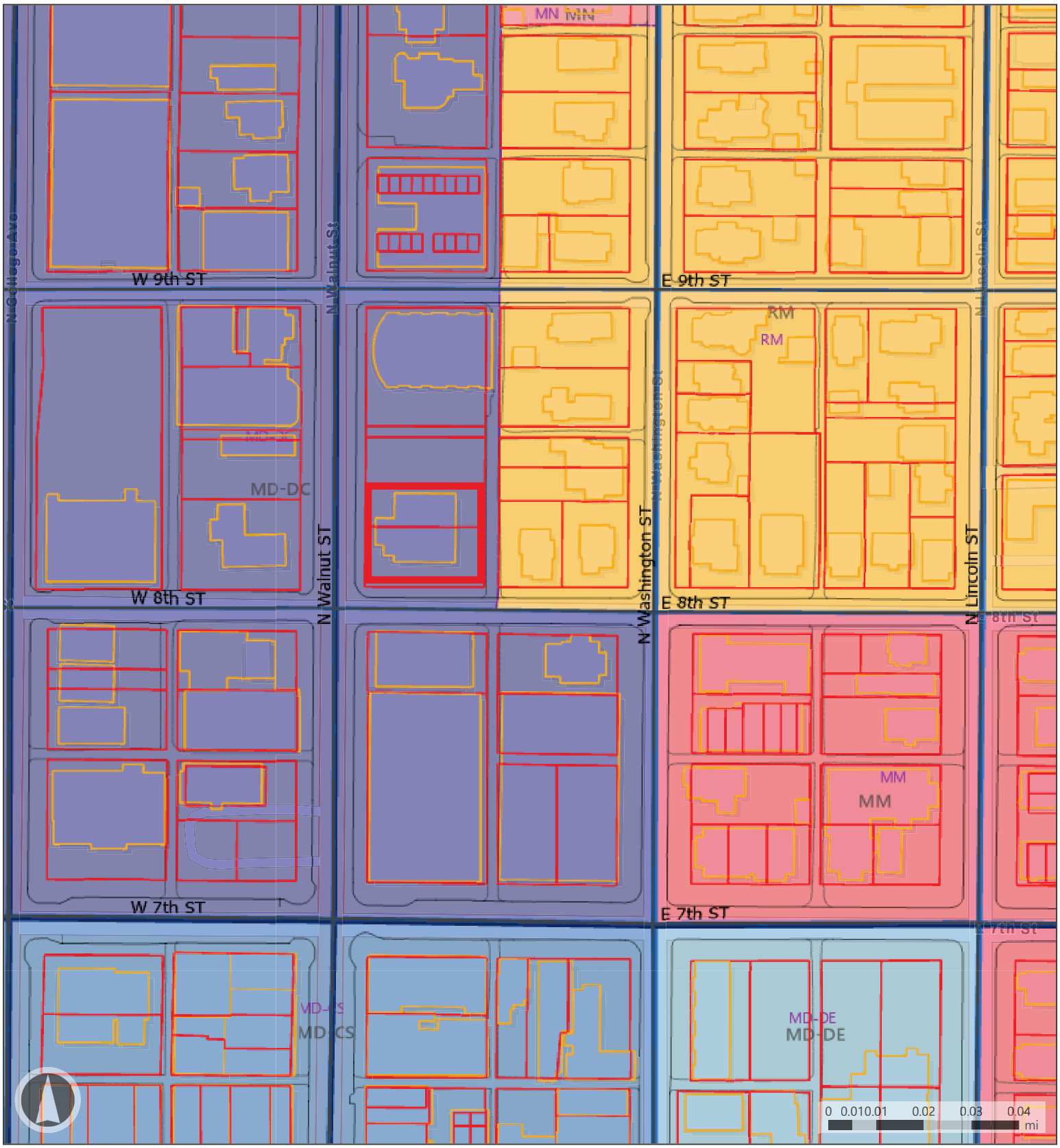
PROPOSED FINDING: The Department does find that the strict application of the terms of the Unified Development Ordinance will result in practical difficulties in the use of the property as the display of flags for this use is customary and there is limited area on the property to place these flag poles. The practical difficulties are peculiar to the property in question in that the existing building location combined with the desire for visibility of the flag poles limits the potential locations. Additionally, in the current Unified Development Ordinance, Downtown buildings are required to be closer to the street and allowed to have a zero setback, so a building with a much larger sense of mass and scale could be built in the same location. The building itself on this property is taller than the flagpoles and is more impactful in terms of mass and scale then the four poles in the setback area.

RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopt the proposed findings and approve V-16-24 with the following condition:

1. This approval is for the number and locations of flag poles as submitted. Any future development or placement of additional flag poles must meet all development standards.

City of Bloomington

Planning and Transportation Department

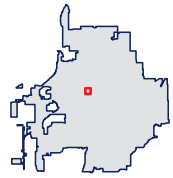


Map Legend

- Parcels
- Buildings
- Pavement
- Alley
- Lane
- Hidden Pavement; Hidden Alley
- OtherPavement
- Current
- City Maintained Streets

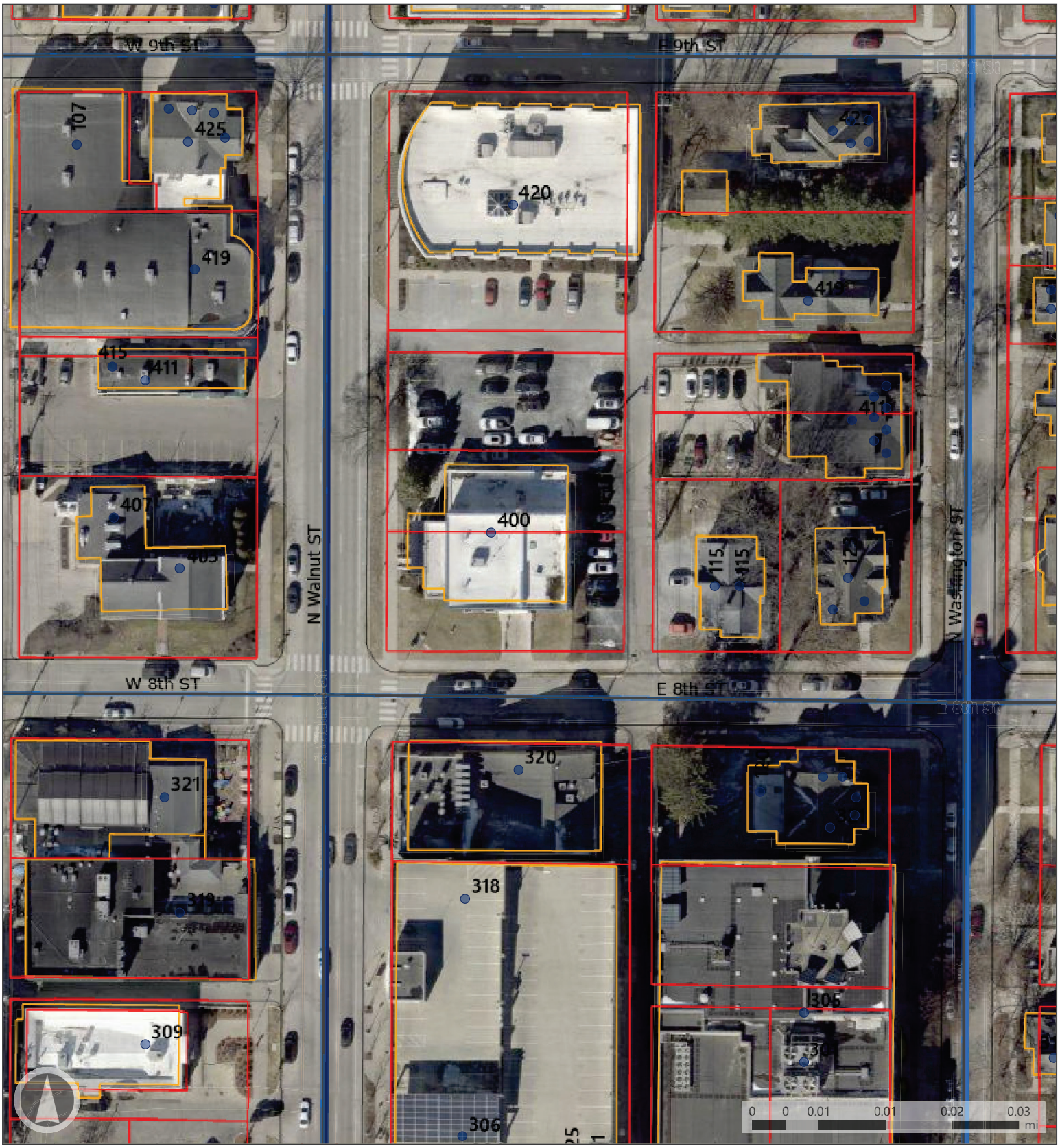
Street

- G
- M



Created: 5/10/2024 *Map By:*

For use as map information only, information is NOT warranted.



Map Legend

- Addresses
- Parcels
- Buildings
- Pavement
- Alley
- Current
- City Maintained Streets

Street Typology

- General Urban
- Main Street
- Neighborhood Connector
- Neighborhood Residential

Created: 5/10/2024 *Map By:*

For use as map information only, information is NOT warranted.

Bloomington Lodge No. 446, B. P. O. Elks
BLOOMINGTON, INDIANA 47401

April 25, 2024

Greetings, members of the Bloomington, Indiana Board of Zoning Appeals:

The Bloomington Elks Lodge #446 is in receipt of your notice of violation of zoning with regard to set back from our property line. We do appreciate your taking the time to meet with our counsel, one of our trustees, and representatives of Building Associates. Pursuant to that meeting, we are filing to request a variance hearing.

General Approval Criteria.

a. The approval will not be injurious to the public health, safety, morals, and general welfare of the community.

The Elks Lodge #446 Tribute to The Services flag installation is what the title implies: A tribute consisting of flags of all branches of the military as well as to the State of Indiana and the United States of America. By no means could this installation be seen as injurious to the public health, safety, morals, and general welfare of our community.

b. The use and value of the area adjacent to the property included in the development standards *variance* will not be affected in a substantially adverse manner; and

The use and values of the area adjacent to the Elks Lodge #446 Tribute to The Services flag installation can in no way substantially affect the adjacent properties in an adverse manner. Directly to the South of the installation is the now defunct Kahlo night club. To the South West is the ever raucous Kilroys Sports Bar. To the west is the defunct Topos restaurant which has stood empty for years, as well as a Papa Johns Pizza substation, and the now defunct Switchyard Brew Pub. The Installation can hardly be seen as a negative addition to the area.

c. The strict application of the terms of this UDO will result in practical difficulties in the use of the property; that the practical difficulties are peculiar to the property in question; that the development standards *variance* will relieve the practical difficulties.

The Order of Elks is distinctly American, and as such, we make the flag of our country the symbol of our order. The Order of Elks was founded on February 16, 1868 by a group of veterans of the civil war who were looking for a way to rally together and do good deeds and charitable works for their community. Throughout the history of the Order of Elks it has welcomed members of all branches of

the armed services, as well as like minded members of our community. The Elks Lodge #446 Tribute to The Services flag installation was conceived, designed, and paid for through contributions of various Elks Lodge members. Strict enforcement of the Bloomington UDO would require the destruction of the installation. The result of strict enforcement of the UDO would be dire indeed. While granting this request for a variance will have no negative impact whatsoever on the immediate area, or the status or stature of the City in general.

Candice Crandall, Head Trustee

Avery Hays, 2 year Trustee

Reid Dallas, 3 year Trustee

Melissa Wallace, Secretary

11' from property line
7' from property line
400 NW ALNUT ST
10'
54sq.ft.
20'
20'
20'
25'
30'
20'
25'
20'


Elks
LODGE #44

BLOOMINGTON BOARD OF ZONING APPEALS **CASE#: CU-17-24**
STAFF REPORT **DATE: May 23, 2024**
LOCATION: 506 E. Wylie Street

PETITIONER: Bloomington Builders LLC & Latitude 39 North Properties, LLC
PO Box 67
Bloomington, IN 47402

REQUEST: The petitioner is requesting Conditional Use approval to allow a "Dwelling, duplex" use in the Residential Small Lot (R3) zoning district.

REPORT: The property is located at 506 E. Wylie Street and is zoned Residential Small Lot (R3). All surrounding properties are zoned Residential Small Lot (R3) and have been developed with single family residences. The property is currently vacant and within the Bryan Park Neighborhood Association area.

The petitioner is proposing to develop the site with a new duplex. The residence would face Wylie Street and be accessed by a driveway along the east side of the residence. Each unit would have its own entry facing Wylie Street with a sidewalk connecting the residence to Wylie Street. There is no sidewalk along this property frontage or sidewalks along adjacent properties. This petition would not be required to install a sidewalk along the property frontage, however new street trees are required and have been shown. The new residence will be two-stories with three bedrooms in each unit.

This petition was presented to both the Bryan Park and Elm Heights Neighborhood Associations. At those meetings neighbors expressed concerns regarding the amount of parking provided, the location of the driveway on the property, tree preservation, and potential for future home ownership of the units. In response to those comments the petitioner has adjusted the location of the driveway on the property to relocate it away from the residence to the west, and extended the length of the driveway. Unfortunately the location of a large Sycamore tree in the center of the property cannot be avoided. Each individual unit in the duplex will have its own entrance and separate utility connection to enable the possibility of future ownership through a condominium design.

The petitioner is requesting conditional use approval to allow the establishment of a "Duplex, dwelling" use on the property.

CRITERIA AND FINDINGS FOR CONDITIONAL USE PERMIT

20.06.040(d)(6)(B) General Compliance Criteria: All petitions shall be subject to review and pursuant to the following criteria and shall only be approved if they comply with these criteria.

i. Compliance with this UDO
ii. Compliance with Other Applicable Regulations
iii. Compliance with Utility, Service, and Improvement Standards
iv. Compliance with Prior Approvals

PROPOSED FINDING: There are use-specific standards that apply to the use "dwelling, duplex" within the R3 zoning district and this petition meets those standards. The property owner does not have any notices of violation on file. Each unit has its own separate exterior entrance and the design of the building incorporates many elements similar to surrounding residences on this block face including- pitched roof, covered porches, and building setback. The structure will contain no more than six bedrooms. Each unit will have its own separate utility meters. The petitioner did attend Bryan Park and Elm Heights Neighborhood Association meetings and presented this petition as required. There are no other known applicable regulations for this petition. There are water and sewer connections available in Wylie Street and no conflicts with connecting to those services have been identified. There are no known prior approvals for this site.

20.06.040(d)(6)(C) ADDITIONAL CRITERIA APPLICABLE TO CONDITIONAL USES

i. Consistency with Comprehensive Plan and Other Applicable Plans

The proposed use and development shall be consistent with and shall not interfere with the achievement of the goals and objectives of the Comprehensive Plan and any other applicable adopted plans and policies.

PROPOSED FINDING: This proposal is in line with the goals of the Comprehensive Plan. The Comprehensive Plan identifies this area as the "Mixed Urban Residential" land use category. The Comprehensive Plan states that the Mixed Urban Residential land use category is largely in older neighborhoods and that redevelopment should be compatible with surroundings. Policy 5.3.1 encourages opportunities for infill and redevelopment across Bloomington with consideration for increased residential densities, complementary design, and underutilized housing types such as accessory dwelling units and duplexes. This location is also well served by existing services and utilities. The proposal also accomplishes many of the design goals of the Comprehensive Plan in relation to compatibility with adjacent structures and has a clear relationship with the adjacent public street through the sidewalk connection from the residence to the sidewalk on the street. The proposal is in line with the Comprehensive Plan.

ii. Provides Adequate Public Services and Facilities

Adequate public service and facility capacity shall exist to accommodate uses permitted under the proposed development at the time the needs or demands arise, while maintaining adequate levels of service to existing development. Public services and facilities include, but are not limited to, streets, potable water, sewer, stormwater management structures, schools, public safety, fire protection, libraries, and vehicle/pedestrian connections and access within the site and to adjacent properties.

PROPOSED FINDING: The site has existing utility connection and no issues have been identified with the proposed connections.

iii. Minimizes or Mitigates Adverse Impacts

1. *The proposed use and development will not result in the excessive destruction, loss or damage of any natural, scenic, or historic feature of significant importance.*
2. *The proposed development shall not cause significant adverse impacts on*

surrounding properties nor create a nuisance by reason of noise, smoke, odors, vibrations, or objectionable lights.

3. *The hours of operation, outside lighting, and trash and waste collection must not pose a hazard, hardship, or nuisance to the neighborhood.*
4. *The petitioner shall make a good-faith effort to address concerns of the adjoining property owners in the immediate neighborhood as defined in the pre-submittal neighborhood meeting for the specific proposal, if such a meeting is required.*

PROPOSED FINDING: There are no regulated natural or scenic features that will be impacted. Although there is one tree in the center of the property that the neighborhood expressed a desired to save, the location of the tree in the center of the property does not allow it to be saved and still develop the lot. The building is not located within a historic district. No significant adverse impacts are expected from the creation of the proposed duplex. No changes to trash and waste collection service are expected. Concerns from adjoining property owners were expressed at the respective Neighborhood Meetings and most have been addressed through the changes mentioned previously.

iv. Rational Phasing Plan

If the petition involves phases, each phase of the proposed development shall contain all of the required streets, utilities, landscaping, open space, and other improvements that are required to comply with the project's cumulative development to date and shall not depend upon subsequent phases for those improvements.

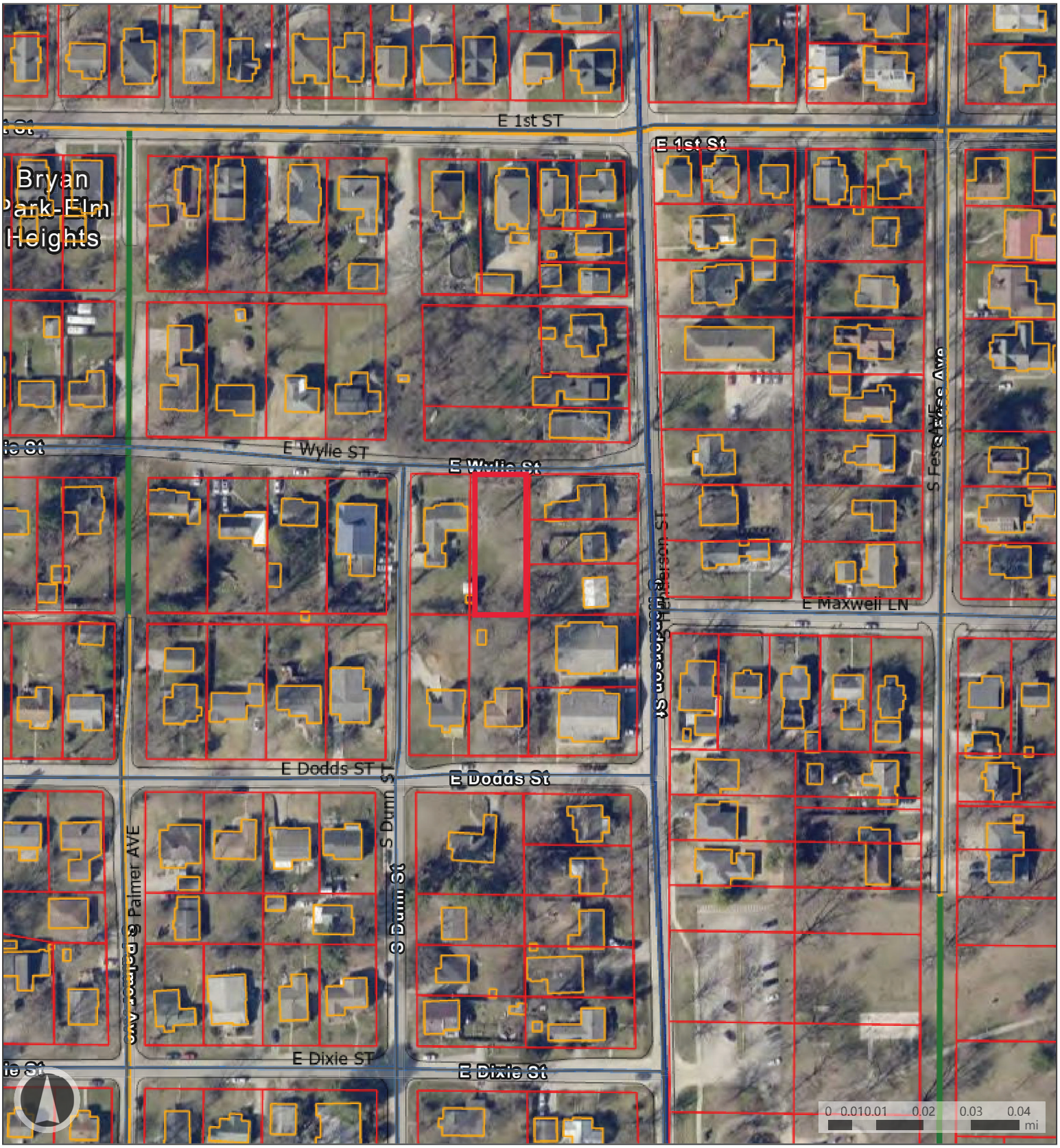
PROPOSED FINDING: No phasing is proposed with this plan.

RECOMMENDATION: The Department recommends that the Board of Zoning Appeals adopts the proposed findings and recommends approval of CU-17-24 with the following conditions:

1. This conditional use approval is limited to the design shown and discussed in the packet.
2. Street trees not more than 30' from center are required along the property frontage.

City of Bloomington

Planning and Transportation Department



Map Legend

- Parcels
- Buildings
- Pavement
- Alley
- Current
- City Maintained Streets

Street Typology

- Neighborhood Connector
- Neighborhood Residential

Functional Classification

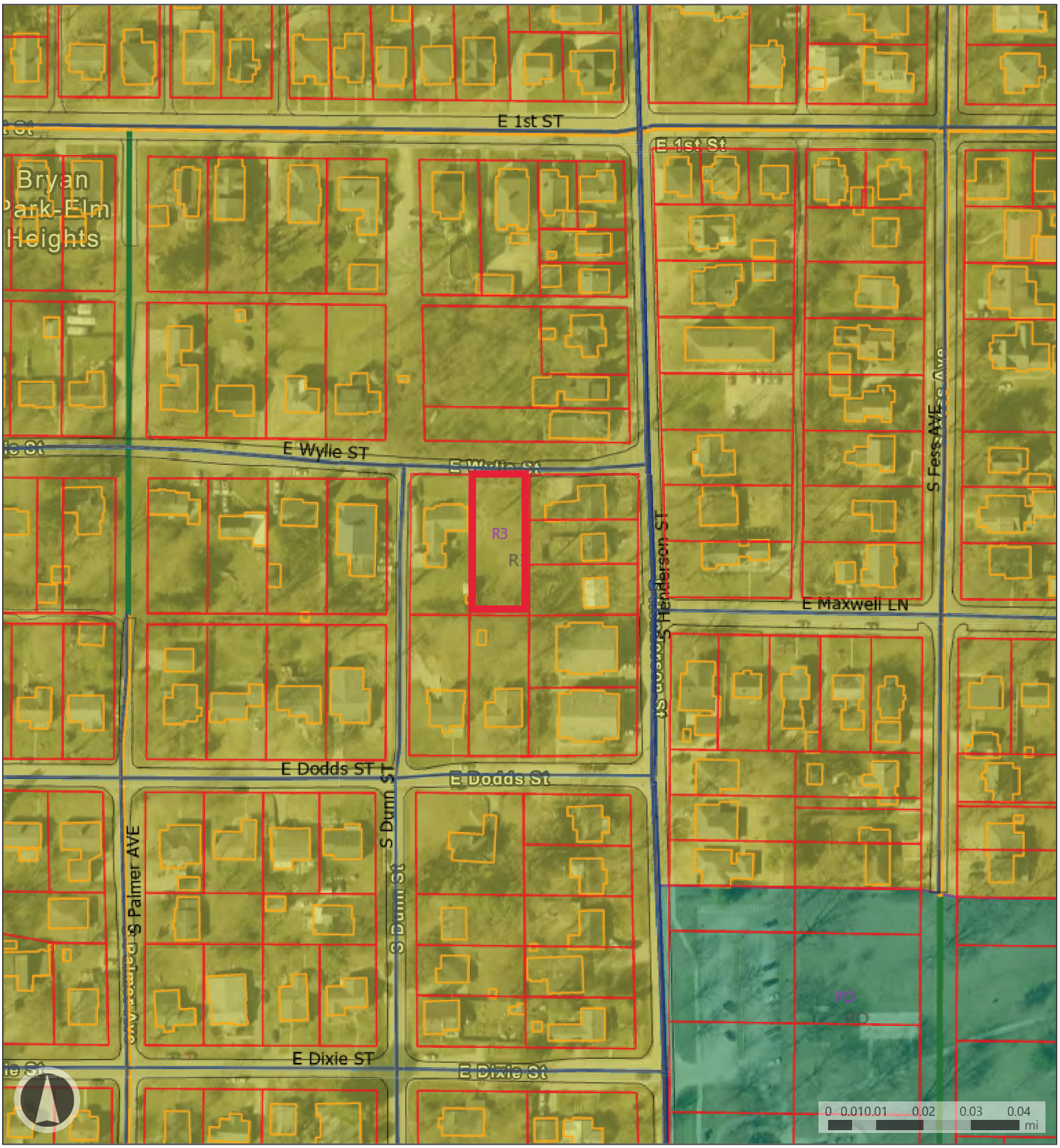
- Secondary Arterial
- Primary Collector

Created: 5/10/2024 *Map By:*

For use as map information only, information is NOT warranted.

City of Bloomington

Planning and Transportation Department



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- Neighborhood Residential

Functional Classification

- Secondary Arterial
- Primary Collector

Created: 5/10/2024 *Map By:*

506 East Wylie Street, LLC

PO Box 67, Bloomington, Indiana

Petitioner's Statement

506 East Wylie Street Residence

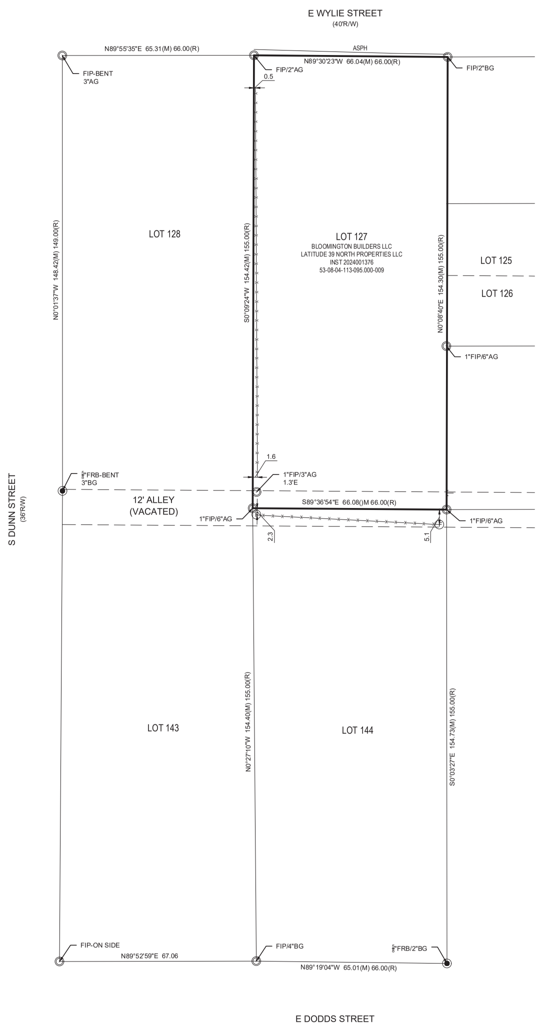
Petitioner: 506 East Wylie Street, LLC, Bloomington, Indiana

Property Description

506 East Wylie Street is a vacant, residential lot near the intersection of East Wylie Street and South Henderson Street in the Bryan Park Neighborhood. The property is zoned R3 (Residential Small Lot). The property is bounded by single family residential uses on all sides as well as multifamily apartments to the Southeast. Adjacent Zoning is R3 on all sides.

Conditional Use Request

506 East Wylie Street, LLC, is filing a request for Conditional Use per the UDO for Dwelling, Duplex construction in R3 Zoning. The proposal meets the design requirements and the development standards in the UDO. The proposal consists of a new 1.5-story structure that includes two 3 bedroom, 3 bath dwelling units. The design reflects the requirements of the UDO in that separate exterior entrances for each unit face East Wylie Street. Additionally, various gable roof pitches reflect similar roof styles found in the surrounding neighborhood. The combination of horizontal "lap style" and vertical board and batten siding also help differentiate each dwelling unit. The building setback and vehicular access is also consistent with other homes along East Wylie Street. New water and sewer service, separate for each unit, has been coordinated with City of Bloomington Utilities and Engineering, and new electrical service, separate for each unit, will be coordinated with Duke Energy. Upon approval, construction would likely begin in December of 2024 with completion expected in the Summer of 2025.



LEGAL DESCRIPTION

Lot 127 in Allendale Second Addition to the City of Bloomington, Indiana, as shown by the plat recorded in Plat Cabinet B, Envelope 41, in the office of the Recorder of Monroe County, Indiana. ALSO, all Grantors right, title and interest in and to a vacated alley adjacent to Lot 127, described above.

GENERAL NOTES

1) ALL MONUMENTS FOUND IN PERFORMANCE OF THIS SURVEY WERE FOUND FLUSH WITH THE EXISTING GROUND UNLESS OTHERWISE NOTED, AND THE AGE AND ORIGIN OF SAID FOUND MONUMENTS ARE UNKNOWN UNLESS OTHERWISE NOTED.
2) ALL SET REBAR IS A 24" REBAR WITH A YELLOW CAP STAMPED "SDG INC FIRM 0101"
3) ALL DIMENSIONS SHOWN HEREON ARE IN FEET AND DECIMALS THEREOF UNLESS OTHERWISE LABELED.
4) REFERENCE IS MADE TO THE FOLLOWING SURVEYS OR PLATS.
ALLENDALE SECOND ADDITION

SURVEYOR'S REPORT

JOB NUMBER: 6899
TYPE OF SURVEY: RETRACEMENT SURVEY
CLASS OF SURVEY: SUBURBAN SURVEY (865 IAC 1-12)
FIELD WORK COMPLETED: APRIL 1, 2024
LOCATION OF SURVEY: E WYLIE ST, BLOOMINGTON, INDIANA

IN ACCORDANCE WITH TITLE 865, ARTICLE 1, CHAPTER 12 (RULE 12) OF THE INDIANA ADMINISTRATIVE CODE (IAC), THE FOLLOWING OBSERVATIONS AND OPINIONS ARE SUBMITTED REGARDING THE UNCERTAINTY IN THE POSITION OF THE LINES AND CORNERS ESTABLISHED AND/OR REESTABLISHED ON THIS SURVEY AS A RESULT OF:

1) AVAILABILITY AND CONDITION OF REFERENCE MONUMENTS.
2) CLARITY AND/OR AMBIGUITY OF THE RECORD DESCRIPTION(S) USED AND/OR THE ADJOINER'S DESCRIPTIONS.
3) OCCUPATION OR POSSESSION LINES.
4) MEASUREMENTS (RELATIVE POSITIONAL ACCURACY)

NOTE: THERE MAY EXIST UNWRITTEN RIGHTS ASSOCIATED WITH THESE UNCERTAINTIES.

1) AVAILABILITY AND CONDITION OF REFERENCE MONUMENTS
MONUMENTS USED IN PERFORMANCE OF THIS SURVEY ARE LABELED HEREON. UP TO 1.5 FEET OF UNCERTAINTY.
2) CLARITY AND/OR AMBIGUITY OF THE RECORD DESCRIPTION(S)
NONE
3) OCCUPATION OR POSSESSION LINES
POSSESSION LINES AT THE TIME OF THE SURVEY ARE SHOWN HEREON.
4) MEASUREMENTS (RELATIVE POSITIONAL ACCURACY)
SUBURBAN SURVEY (+/- 0.13 FOOT PLUS 100 PARTS PER MILLION) AS DEFINED IN 865 IAC 1-12, EFFECTIVE MAY 4, 2006.
THEORY OF LOCATION
THE FOUND MONUMENTS SHOWN HEREON WERE HELD FOR THEIR RESPECTIVE CORNERS.

SURVEYOR'S CERTIFICATE

THIS SURVEY WAS PERFORMED UNDER THE DIRECTION OF THE UNDERSIGNED, AND TO THE BEST OF THIS SURVEYOR'S KNOWLEDGE AND BELIEF WAS EXECUTED ACCORDING TO SURVEY REQUIREMENTS IN 865 IAC 1.12 FOR THE STATE OF INDIANA. THE FIELD WORK WAS COMPLETED ON APRIL 1, 2024.

DATED APRIL 3, 2024

TMB

TODD M. BORGMAN
REGISTERED LAND SURVEYOR NO. 21200021
STATE OF INDIANA

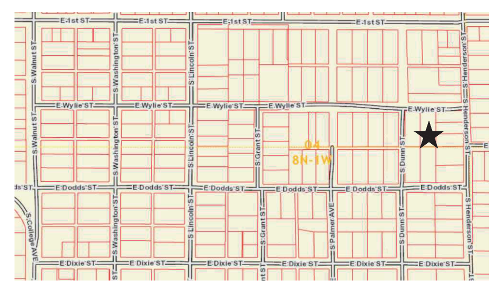
TODD M. BORGMAN REGISTERED No. LS21200021 STATE OF INDIANA LAND SURVEYOR

I AFFIRM, UNDER THE PENALTIES FOR PERJURY, THAT I HAVE TAKEN REASONABLE CARE TO REDACT EACH SOCIAL SECURITY NUMBER IN THIS DOCUMENT, UNLESS REQUIRED BY LAW. (TODD BORGMAN)

LEGEND

RR SPIKE		M	MEASURED
STONE		P	PLATTED
REBAR		R	RECORD
IRON PIPE		FRB	FOUND REBAR
MAG NAIL		SRB	SET REBAR
UTILITY POLE		FIP	FOUND IRON PIPE
FENCE		FRS	FOUND RAILROAD SPIKE
		FMAG	FOUND MAG NAIL
		SMAG	SET MAG NAIL
		B/C	BUILDING CORNER
		FND	FOUND

BASIS OF BEARINGS:
INDIANA STATE PLANE,
WEST ZONE



SMITH DESIGN GROUP
CIVIL ENGINEERING - LAND SURVEYING
1467 W Arlington Rd Bloomington, IN 47404
(812) 336-6536 - smithdginc.com

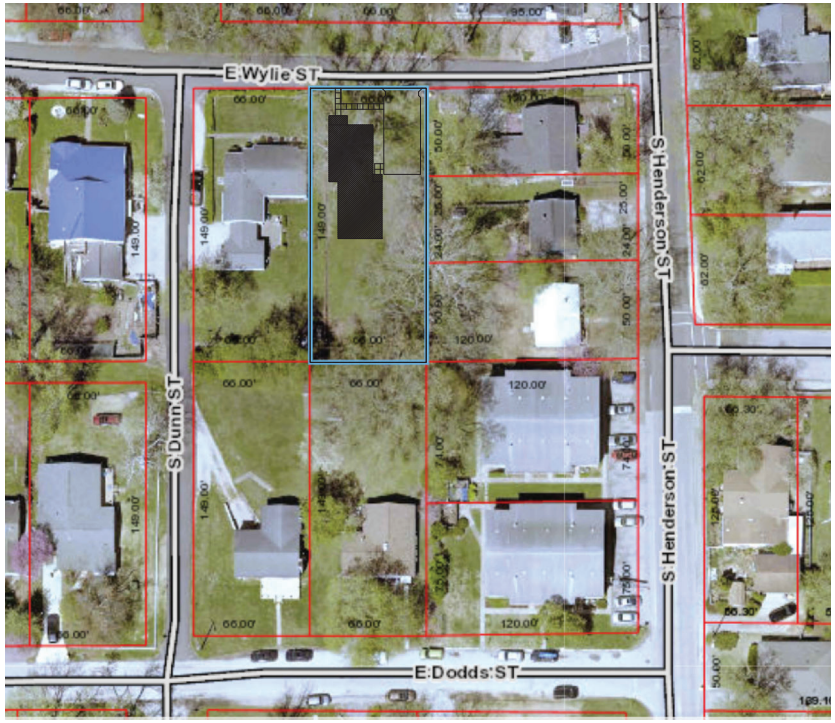
SCALE: 1"=20'
0 10 20

JOB TITLE
BOUNDARY SURVEY
E WYLIE STREET
BLOOMINGTON, INDIANA
SEC 4-T8N-R1W

REVISIONS	BY	DATE

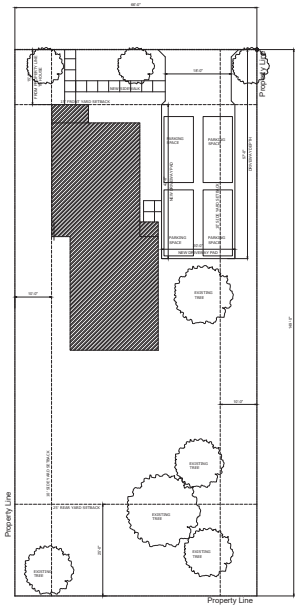
FIELD TS
DRAFTED TMB
CHECKED TMB

JOB NUMBER 6899
SHEET 1 OF 1
DATE 4/3/24
BOUNDARY SURVEY



01 VICINITY MAP

SCALE: 1/32" = 1'-0"



TREE PLOT
- PLANT NEW STREET TREES NO GREATER THAN 30' FROM CENTERLINE OF TREES
- THREE TREES PLANTED, WHITE OAK
- TREES ARE 2" MINIMUM CALIPER SIZE
- SMALL STREET TREES SELECTED DUE TO O.H. UTILITY LINES

SIDEWALK
- NEW 6' SIDEWALK CONSTRUCTION. APPROXIMATELY 66 LINEAL FEET
- NEW SIDEWALK CONSTRUCTION TO CONNECT TO EXISTING SIDEWALK
- 5' TREE PLOT TO BE MAINTAINED BETWEEN STREET CURB AND NEW SIDEWALK CONSTRUCTION

02 PROPOSED SITE PLAN

SCALE: 1/16" = 1'-0"

Bloom
Design + Build
Design • Construction • Consulting

Scope of Work:

REFER TO ARCHITECTURAL SHEETS BY OTHERS FOR SCOPE

EAST WYLIE NEW DUPLEX

East Wylie Street
Bloomington, IN 47401

Table of Contents

SITE PLAN

Square Feet Totals

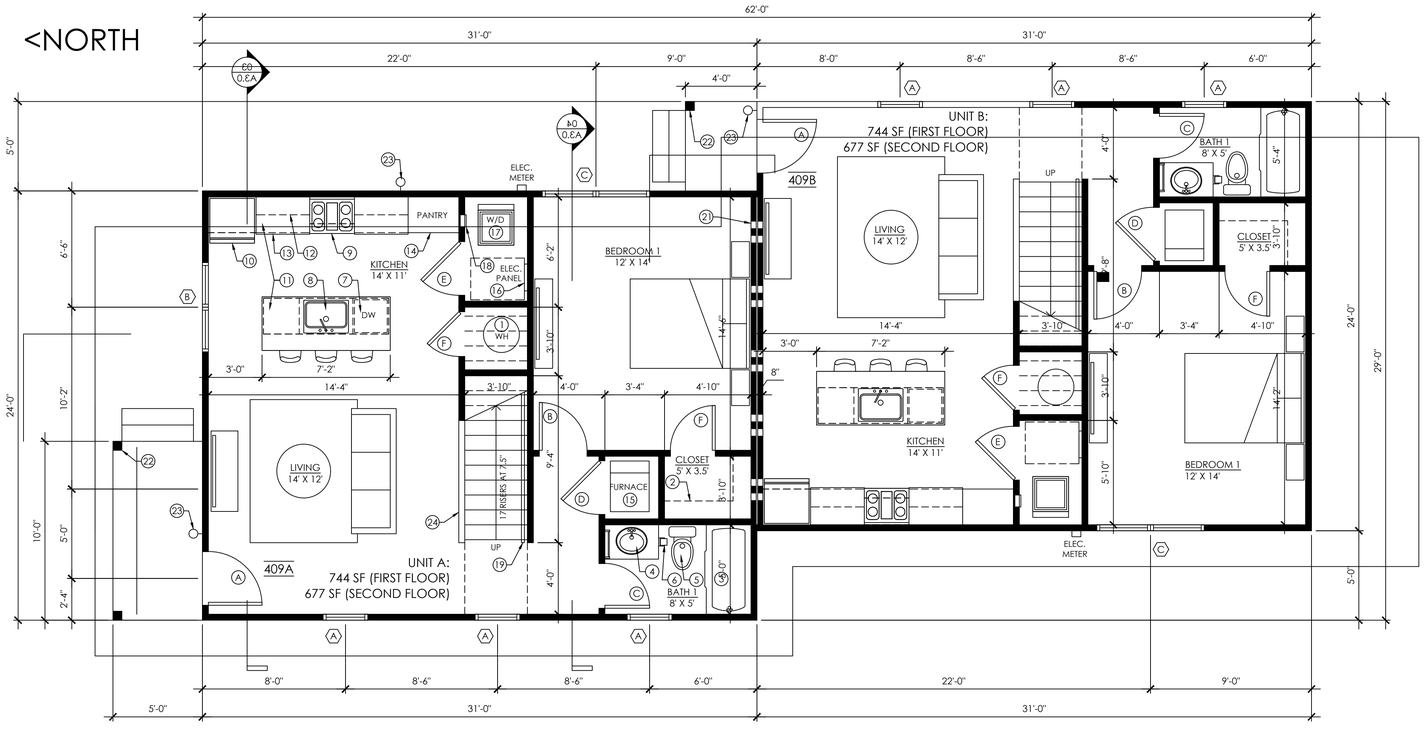
Lot Size	9,834 sf
Building Footprint	1,558 sf
Sidewalk & Driveway	1,098 sf
TOTAL Impervious Surface Area	2,656 sf
Impervious Area Percentage	27.0%

No.	Revision / Issue	Date
1		
2		
3		
4		

Project Phase: SITE PLAN
Date: 05.13.2024
Drawn By: bloom design build
Scale: Refer to Sheets
Sheet No.: SITE

506 East Wylie Street Duplex
Preliminary Plan Set

OWNER:
506 EAST WYLIE STREET, LLC

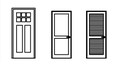


FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"

DOOR SCHEDULE

NO	DOOR SIZE WIDTH	HEIGHT	THICK.	TYPE	MATERIAL	LOCK SET	FRAME MATERIAL	REMARKS
A	3'-0"	7'-0"	1 3/8"	1	FIBER-GLASS	ENTRY	WOOD	HINGE PIN AUTO-CLOSER
B	2'-8"	6'-8"	1 3/4"	2	S.C.-COMP.	PRIVACY	WOOD	
C	2'-6"	6'-8"	1 3/4"	2	S.C.-COMP.	PRIVACY	WOOD	
D	3'-0"	6'-8"	1 3/4"	3	S.C.-COMP.	PASSAGE	WOOD	LOUVERED
E	3'-0"	6'-8"	1 3/4"	2	S.C.-COMP.	PASSAGE	WOOD	
F	2'-6"	6'-8"	1 3/4"	2	S.C.-COMP.	PASSAGE	WOOD	

DOOR TYPES



GENERAL NOTES

A. FINAL DOOR SELECTION BY OWNER.
B. INTERIOR DOOR AND WINDOW CASINGS TO BE 2-1/2" WIDE.
C. ALL FINAL FINISHES TO BE SELECTED BY OWNER.
D. CASEWORK FINISHES TO BE FINALIZED BY OWNER.

WINDOW SCHEDULE

NO	WINDOW SIZE WIDTH	HEIGHT	HEAD HT.	TYPE	MATERIAL	GLAZING	REMARKS
A	2'-6"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	
B	5'-0"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	
C	6'-0"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	EGRESS
D	2'-6"	2'-6"	8'-0"	FIXED	VINYL	LOW-E	

WINDOW TYPES

GENERAL NOTES

A. PROVIDE SAFETY GLAZING IN HAZARDOUS LOCATION. (R308.4)
B. PROVIDE EGRESS WINDOWS IN ALL SLEEPING SPACES

ROOM FINISH SCHEDULE

ROOM NAME	FLOOR	BASE	WALLS	CEILING TYPE	CEILING HEIGHT (AFF)	REMARKS
RESIDENTIAL ENTRY	LVT	MDF	P-GWB	P-GWB	9'-0"	
KITCHEN	LVT	MDF	P-GWB	P-GWB	9'-0"	
LIVING/DINING	LVT	MDF	P-GWB	P-GWB	9'-0"	
BEDROOM	LVT	MDF	P-GWB	P-GWB	9'-0"	
BEDROOM CLOSET	LVT	MDF	P-GWB	P-GWB	9'-0"	
BATH	LVT	MDF	P-GWB	P-GWB	9'-0"	
LAUNDRY/MECH. CLOSET	LVT	MDF	P-GWB	P-GWB	9'-0"	
EXIST. UTILITY	EXISTING	EXISTING	EXISTING	GWB	9'-0"	
LEASING OFFICE	EXISTING	EXISTING	EXISTING	P-GWB	9'-0"	
EXIST. BATH @ OFFICE	EXISTING	EXISTING	EXISTING	P-GWB	9'-0"	

GENERAL NOTES:

A. WALLS TO BE PAINTED GYPSUM WALL BOARD THROUGHOUT. PAINT SHEEN TO BE 'PEARL (SATIN)'.
B. CEILINGS TO BE PAINTED GYPSUM WALLBOARD WITH SMOOTH FINISH. PAINT SHEEN TO BE 'EGGSHELL'.
C. PAINTED WOOD WALL BASE THROUGHOUT. PAINT SHEEN TO BE 'SEMI-GLOSS'.
D. ALL FINAL FINISHES TO BE SELECTED BY OWNER.

ROOM FINISH KEY

ABBREVIATION:

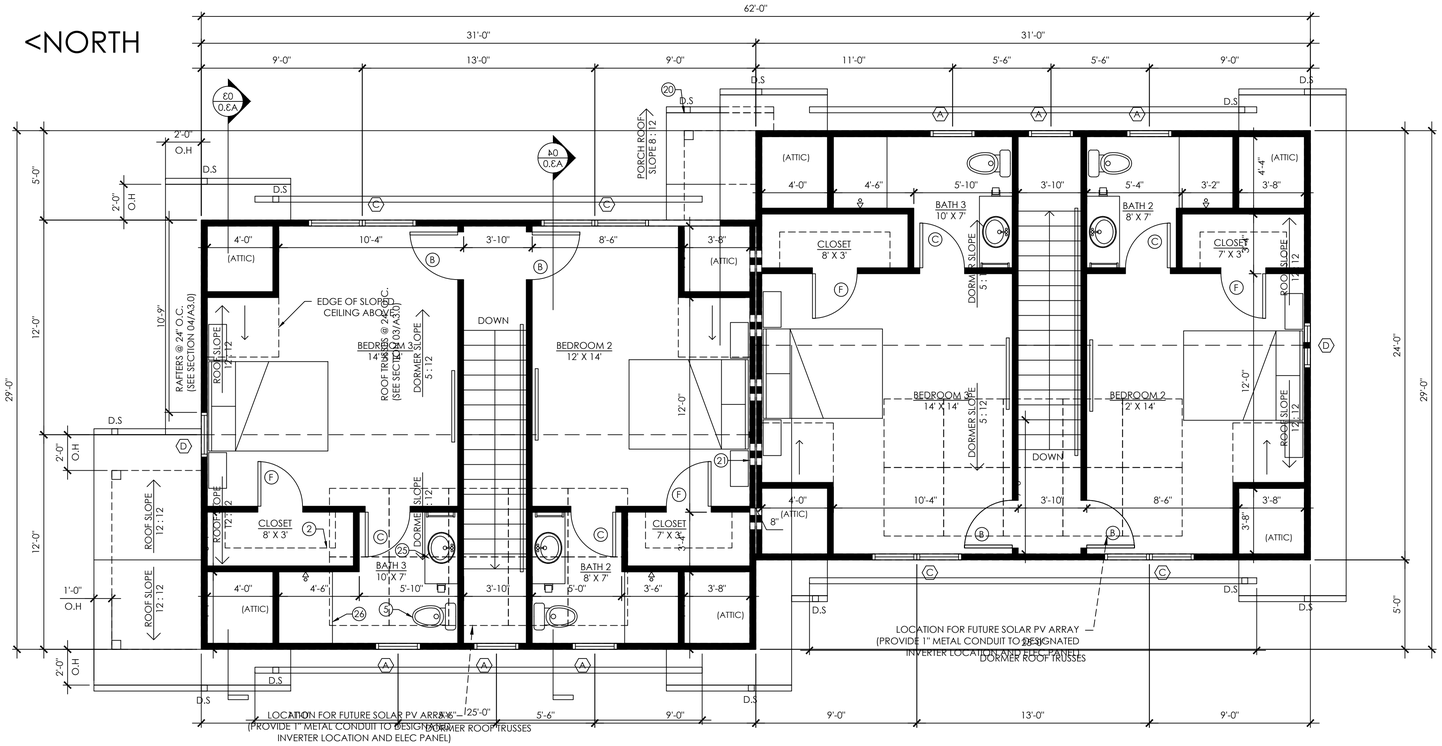
OPEN	OPEN TO STRUCTURE
CPT	CARPET
VCT	VINYL COMPOSITION TILE
LVT	LUXURY VINYL TILE FLOORING
CONC	FINISHED CONCRETE
S-CONC	SEALED CONCRETE
RB	RUBBER BASE
MDF	MDF BASE
P-GWB	PAINTED GYPSUM WALLBOARD
GWB	GYPSUM WALLBOARD, UNFINISHED

GENERAL FLOOR PLAN NOTES:

A. ALL DIMENSIONS ARE TO FACE OF FRAMING OR CENTER OF STRUCTURE OR OPENING, U.N.O.
B. ALL INTERIOR PARTITION WALLS SHALL BE 2X4'S AT 16" O.C. W/ 1/2" GWB BOTH SIDES W/ SOUND ATTENUATION BATH, U.N.O.
C. EXTEND ALL GYPSUM WALL BOARD (G.W.B.) TO FRAMING ABOVE, U.N.O.
D. PROVIDE ALL NECESSARY TEMPORARY SUPPORT FOR WALLS, FLOORS, AND ROOFS PRIOR TO COMPLETION OF PERMANENT VERTICAL AND LATERAL LOAD SYSTEMS.
E. PROVIDE ALL NECESSARY PERMANENT SUPPORT FOR CABINETS, SHELVING, FIXTURES, ETC.
F. PROVIDE SOUND ATTENUATION BLANKETS IN ALL INTERIOR BEDROOM, BATHROOM, MECH. ROOM, AND LAUNDRY ROOM WALLS.
G. PROVIDE BLOCKINGS FOR THE FUTURE INSTALLATION OF GRAB BARS, AND SHOWER SEATS AT WATER CLOSET, BATHTUBS, AND SHOWER AT TYPE B UNIT.

FLOOR PLAN KEY NOTES:

1. NEW STACKED WASHER & DRYER
2. HANGING ROD & SHELF
3. FIBERGLASS SHOWER W/WALL SURROUND W/ SHOWER CURTAIN ROD
4. 34" H X 36" W VANITY W/SINK AND WALL MIRROR
5. WATER CLOSET
6. TOILET ACCESSORIES: TOWEL BAR AND TOILET PAPER DISPENSER
7. 24" W UNDERCOUNTER DISHWASHER
8. 36" W SINK W/GARBAGE DISPOSAL
9. 36" W STOVE WITH RANGE HOOD ABOVE
10. 36" W REFRIGERATOR
11. 36" H COUNTERTOP
12. 12" D UPPER WALL CABINETS
13. 24" D BASE CABINETS
14. TALL CABINET
15. FURNACE
16. ELECTRICAL PANEL
17. WATER HEATER
18. WASHER CONNECTION BOX
19. HANDRAIL
20. ROOF LINE BELOW, TYP.
21. 1-HOUR SEPARATION WALL: DOUBLE 2X4 W/ 1" AIR GAP, SOUND BATT INSULATION AND 5/8" TYPE 'X' GWB, EACH SIDE, REF. 03/A3.1
22. PORCH COLUMN, SEE ELEVATIONS
23. WALL SCONCE (SEAGULL DARK SKY BARN LIGHT, OR EQ.)
24. PARTIAL HEIGHT WALL
25. 34" H X 48" W VANITY W/SINK AND WALL MIRROR
26. 36" X 48" SHOWER



SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"

DOOR SCHEDULE (C)

NO.	DOOR SIZE WIDTH	HEIGHT	THICK.	TYPE	MATERIAL	LOCK SET	FRAME MATERIAL	REMARKS
A	3'-0"	7'-0"	1 3/8"	1	FIBER-GLASS	ENTRY	WOOD	HINGE PIN AUTO-CLOSER
B	2'-8"	6'-8"	1 3/4"	2	S.C.-COMP.	PRIVACY	WOOD	
C	2'-6"	6'-8"	1 3/4"	2	S.C.-COMP.	PRIVACY	WOOD	
D	3'-0"	6'-8"	1 3/4"	3	S.C.-COMP.	PASSAGE	WOOD	LOUVERED
E	3'-0"	6'-8"	1 3/4"	2	S.C.-COMP.	PASSAGE	WOOD	
F	2'-6"	6'-8"	1 3/4"	2	S.C.-COMP.	PASSAGE	WOOD	

DOOR TYPES

GENERAL NOTES

A. FINAL DOOR SELECTION BY OWNER.
B. INTERIOR DOOR AND WINDOW CASINGS TO BE 2-1/2" WIDE.
C. ALL FINAL FINISHES TO BE SELECTED BY OWNER.
D. CASEWORK FINISHES TO BE FINALIZED BY OWNER.

WINDOW SCHEDULE (A)

NO.	WINDOW SIZE WIDTH	HEIGHT	HEAD HT.	TYPE	MATERIAL	GLAZING	REMARKS
A	2'-6"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	
B	5'-0"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	
C	6'-0"	5'-0"	8'-0"	D.H.	VINYL	LOW-E	EGRESS
D	2'-6"	2'-6"	8'-0"	FIXED	VINYL	LOW-E	

WINDOW TYPES

GENERAL NOTES

A. PROVIDE SAFETY GLAZING IN HAZARDOUS LOCATION. (R308.4)
B. PROVIDE EGRESS WINDOWS IN ALL SLEEPING SPACES

ROOM FINISH SCHEDULE

ROOM NAME	FLOOR	BASE	WALLS	CEILING TYPE	HEIGHT (AFF)	REMARKS
RESIDENTIAL ENTRY	LVT	MDF	P-GWB	P-GWB	9'-0"	
KITCHEN	LVT	MDF	P-GWB	P-GWB	9'-0"	
LIVING/DINING	LVT	MDF	P-GWB	P-GWB	9'-0"	
BEDROOM	LVT	MDF	P-GWB	P-GWB	9'-0"	
BEDROOM CLOSET	LVT	MDF	P-GWB	P-GWB	9'-0"	
BATH	LVT	MDF	P-GWB	P-GWB	9'-0"	
LAUNDRY/MECH. CLOSET	LVT	MDF	P-GWB	P-GWB	9'-0"	
EXIST. UTILITY	EXISTING	EXISTING	EXISTING	GWB	9'-0"	
LEASING OFFICE	EXISTING	EXISTING	EXISTING	P-GWB	9'-0"	
EXIST. BATH @ OFFICE	EXISTING	EXISTING	EXISTING	P-GWB	9'-0"	

GENERAL NOTES:

A. WALLS TO BE PAINTED GYPSUM WALL BOARD THROUGHOUT. PAINT SHEEN TO BE 'PEARL (SATIN)'.
B. CEILINGS TO BE PAINTED GYPSUM WALLBOARD WITH SMOOTH FINISH. PAINT SHEEN TO BE 'EGGSHELL'.
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ABBREVIATION:

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RB	RUBBER BASE
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GWB	GYPSUM WALLBOARD, UNFINISHED

GENERAL FLOOR PLAN NOTES:

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B. ALL INTERIOR PARTITION WALLS SHALL BE 2X4'S AT 16" O.C. W/ 1/2" GWB BOTH SIDES W/ SOUND ATTENUATION BATH, U.N.O.
C. EXTEND ALL GYPSUM WALL BOARD (G.W.B.) TO FRAMING ABOVE, U.N.O.
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E. PROVIDE ALL NECESSARY PERMANENT SUPPORT FOR CABINETS, SHELVING, FIXTURES, ETC.
F. PROVIDE SOUND ATTENUATION BLANKETS IN ALL INTERIOR BEDROOM, BATHROOM, MECH. ROOM, AND LAUNDRY ROOM WALLS.
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FLOOR PLAN KEY NOTES:

1. NEW STACKED WASHER & DRYER
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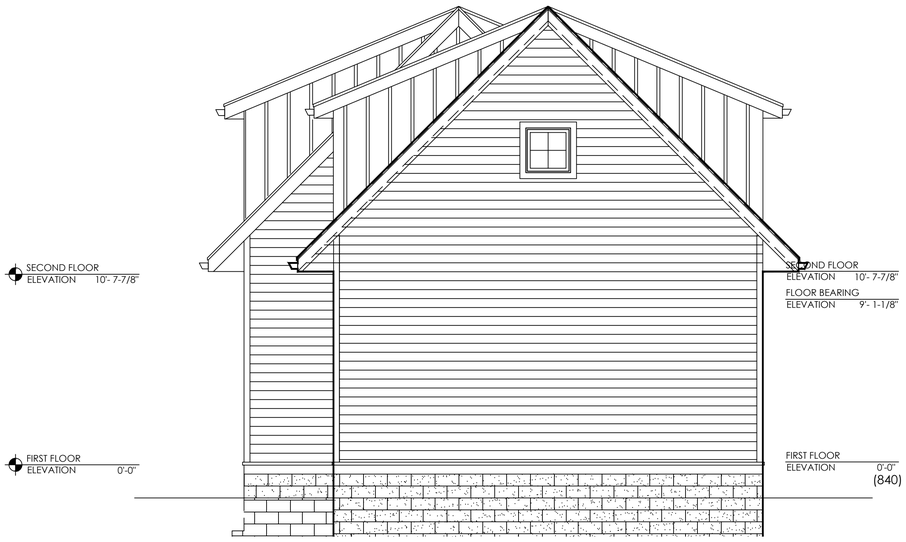
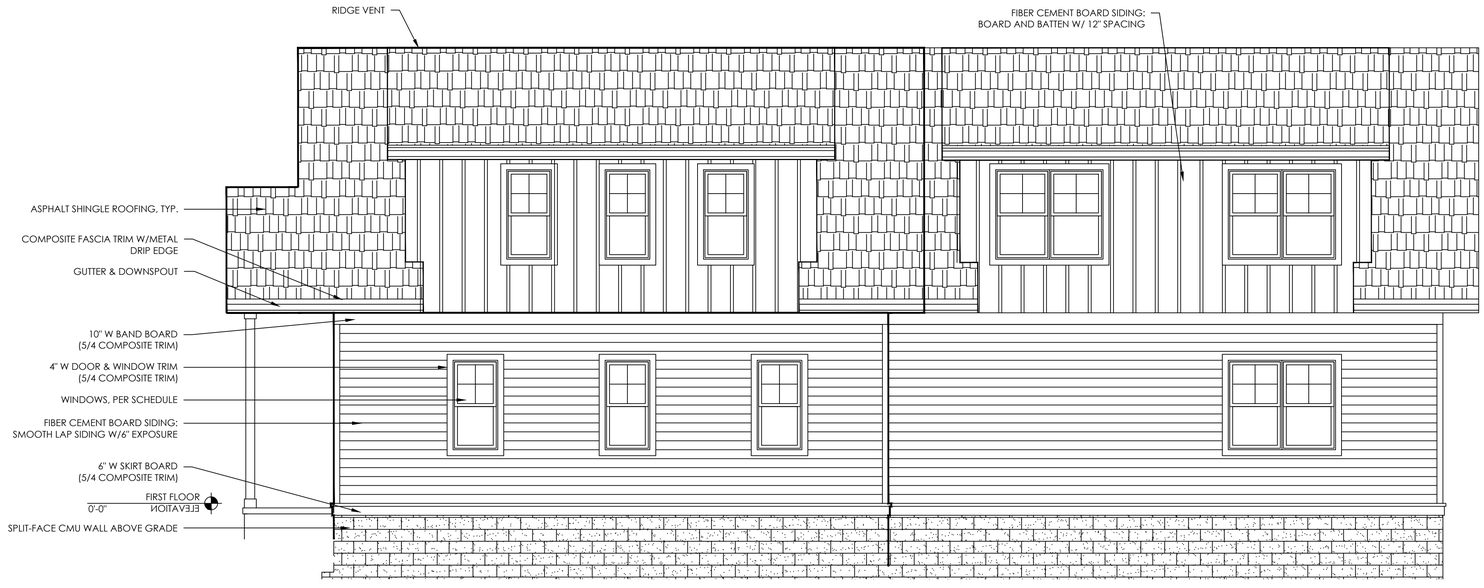
14. TALL CABINET
15. FURNACE
16. ELECTRICAL PANEL
17. WATER HEATER
18. WASHER CONNECTION BOX
19. HANDRAIL
20. ROOF LINE BELOW, TYP.
21. 1-HOUR SEPARATION WALL: DOUBLE 2X4 W/ 1" AIR GAP, SOUND BATT INSULATION AND 5/8" TYPE 'X' GWB, EACH SIDE, REF. 03/A3.1
22. PORCH COLUMN, SEE ELEVATIONS
23. WALL SCONCE (SEAGULL DARK SKY BARN LIGHT, OR EQ.)
24. PARTIAL HEIGHT WALL
25. 34" H X 48" W VANITY W/SINK AND WALL MIRROR
26. 36" X 48" SHOWER

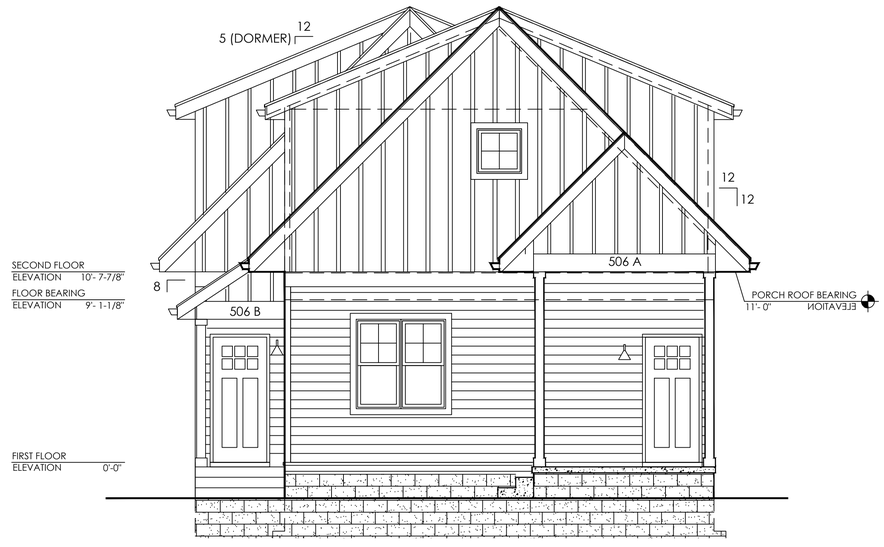
EAST ELEVATION
SCALE: 1/4" = 1'-0"



SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



WEST ELEVATION
SCALE: 1/4" = 1'-0"



NORTH ELEVATION
SCALE: 1/4" = 1'-0"

BLOOMINGTON

Jacqueline Scanlan <scanlanj@bloomington.in.gov>

506 East Wylie Proposed Duplex Construction

Amy Stupka <amyrunswithhorses@gmail.com> Thu, May 9, 2024 at 3:52 PM
To: scanlanj@bloomington.in.gov, planning@bloomington.in.gov

Greetings Jackie and all,

My husband and I live north of the proposed construction site, and have some concerns related to the proposed 6 bedroom, 6 bathroom duplex construction. Our primary concern is for the safety of the neighborhood related to traffic and parking congestion on Wylie. Even now, with that lot currently vacant, cars frequently fill the narrow road creating a one-way street. Our neighbor accross Wylie frequently has difficulty backing out of his driveway, and it is difficult for pedestrians to see what is coming without stepping into the road. We are very concerned that the addition of 6 more cars to this small area of road will create an unsafe situation. Even though 4 parking spaces will be part of the plan, it seems clear that even the addition of a minimum of 2 more cars coming is a concern.
Another major concern is the existence of a magnificent sycamore tree that beautifies the intersection and neighborhood surroundings. Such trees exemplify the beauty of this special neighborhood as well as provide a nesting location for hawks and other wildlife adding to the character. We expressed our concerns to the contractor directly, and feel that he was very receptive to the concerns, but want to make sure that planners are also aware of them.
Is it possible to restrict street parking on Wylie to residents? These restrictions could help alleviate the current problem as well as help prevent worsening the situation with the addition of as many as 6 more drivers.

Thank you very much for your attention to these concerns.

Sincerely,

Amy Stupka
814 South Henderson Street
828-215-6098

BLOOMINGTON

Eric Greulich <greulice@bloomington.in.gov>

Fwd: 506 E. Wylie Duplex Proposal

Jacqueline Scanlan <scanlanj@bloomington.in.gov> Fri, May 3, 2024 at 3:16 PM
To: Eric Greulich <greulice@bloomington.in.gov>

I'm sure you'll get this from the front, but fyi!

Jackie

---------- Forwarded message ---------
From: **ian woollen** <iwool@hotmail.com>
Date: Fri, May 3, 2024 at 2:47 PM
Subject: RE: 506 E. Wylie Duplex Proposal
To: planning@bloomington.in.gov <planning@bloomington.in.gov>, scanlanj@bloomington.in.gov <scanlanj@bloomington.in.gov>, isabel piedmont <piedmoni@bloomington.in.gov>, caylan.m.evans@gmail.com <caylan.m.evans@gmail.com>

Hi - I was at the BPNA meeting last night and heard the presentation from architect/developer Caylan Evans for a new duplex at 506 E. Wylie.

I just want to register my concern that the arrangement of 6 beds with 6 baths seems obviously aimed at the student market, rather than a family tenant. Cutting the number of bathrooms from 3 down to 2 in each unit would allow for a larger master bedroom and be more likely to attract a family tenant.

Thanks for your time.

Regards,

Ian Woollen

1106 S. Washington

May 17, 2024

Dear Members of the Bloomington Zoning Appeals:

I am writing to ask you to reject the proposed infill project at 506 E. Wylie. The project is too big to maintain a consistency of style with the existing mid-century style houses on Wylie. It's a a challenge to fit 6 bedrooms and 6 bathrooms in any house. Also, the proposed project does not meet design mandates of the UDO (see below).

The proposed, large, multi-gabled roof lines, vertical roof pitch and orientation of the building does not resemble the established style of the established houses on Wylie. The houses on Wylie, from Henderson to Lincoln, were built in the early 1950s and are exceptionally consistent and harmonious in the roof pitch, porch depth, front building setbacks, massing, shape, size, and design with the broad side of the house facing Wylie. In this letter I have included images of all the houses on the south side of Wylie.

At our last Bryan Park Neighborhood Assocition meeting, the developer was asked how he was going to address this design issue. He did say it was a problem but did not offer a solution. At the Elm Heights neighborhood meeting, the developer said he was going to revise the plans. Several neighbors requested a readable digital file because the document he brought was so small that many of the numbers were unreadable. At this date, we have not received any.

The Bryan Park houses are generally more affordable than most of the neighborhoods in Bloomington. We have seen an uptick of developers purchasing property in the neighborhood for the land itself. The developer said that the price range for the duplex was going to be approximately $1,000 per bedroom.

One of the goals for infill projects in the Comprehensive Plan is to ensure all land development activity makes a positive and lasting community contribution. This project will not meet this goal.

Sincerely,
Jan Sorby

From the UDO:

Pg. 89: Chapter 20.03, Use Regulations Design: In the R1, R2, R3, and R4 zoning districts the following shall apply: Each unit in a newly constructed duplex dwelling shall have a separate exterior entrance facing a public or private street. The following design elements of the duplex dwelling shall be similar in general shape, size, and design with the majority of existing single-family or duplex structures on the same block face on which it is located: Roof pitch; Front porch width and depth; Front building setback; and Vehicle parking access (i.e., front-, side-, or rear-access garage or parking area). No duplex dwelling structure shall contain more than six bedrooms total. Each individual dwelling unit shall have separate utility meters.

Pg. 18: R3: Residential Small Lot Purpose: The R3 district is intended to protect and enhance established residential neighborhoods by increasing the viability of owner-occupied and affordable dwelling units through small-lot subdivisions, accessory dwelling units, and property improvements compatible with surrounding development patterns. The conversion of existing housing stock to more intense land uses is discouraged.

From the Comprehensive Plan

Pg. 16: Housing & Neighborhoods Objective: Overall this chapter supports the following Vision Statement principles: 11. Ensure all land development activity makes a positive and lasting community contribution.

Pg. 60: Housing Trends and Issues: Most core neighborhoods are stable but are trending towards a lower percentage of new single-family homes. With greater density in the city comes the challenge to preserve neighborhood character and the opportunity to strengthen neighborhoods by developing small commercial nodes as community gathering places. Existing core neighborhoods should not be the focus of the city's increasing density.

Pg. 62: Many neighborhoods in Bloomington were developed during a span from the late 1800s through the 1950s. These older homes are generally well built and have distinctive architectural features. They also often have smaller footprints compared to more modern homes. As seen in communities across the nation, this can lead to the phenomenon of people purchasing these homes purely for their desirable urban locations and tearing down the existing structure to make way for a brand-new home, which often features an excessively large footprint and a contemporary architectural style. Such homes may not fit into the period context of their surroundings and can negatively impact the fabric of the entire neighborhood. Unchecked, this practice can lead to the large-scale loss of a community's historic integrity and also the loss of affordable housing stock.

All the Houses located on the South side of East Wylie, from Henderson to Lincoln

430 E Wylie

424 E Wylie

414 E Wylie

412 E Wylie

408E Wylie

400E Wylie

318 E Wylie

The block faces of east Wylie from Henderson to Lincoln streets consist of split-level and small ranch style houses, built in the early 1950s.

The houses are exceptionally consistent in shape, size, and design with the broad side of the house facing the street. The roof pitches, porch depths and widths, front building setbacks, and massing are uniform and harmonious.